

SEQUENCE LISTING

<110> Microbial Technics Limited

Le Page, Richard WF

Wells, Jeremy M

Hanniffy, Sean B

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<140> PCT/GB99/02444

<141> 1999-07-27

<150> GB 9816335.5

<151> 1998-07-27

<150> US 60/125163

<151> 1999-03-19

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<170> PatentIn Ver. 2.1

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Ser Thr Pro Ser Thr Asn Thr Thr Asn Ser Ser Gln Ala Asp Ser Lys
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Pro Gly Gln Ser Thr Lys Thr Glu Leu Lys Pro Glu Pro Thr Leu Pro
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30

Glu Glu Val Val Gly Thr Ala Leu Asp Leu Gly Ile Ile Asn Asn Lys

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Val Gln Glu Ser Val Ser Gly Val Lys Val Thr Lys Ser Leu Cys Tyr

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Gln Glu Gln Glu Ile Ala Ser Phe Gln Glu Ile Asn Gln Met Thr Phe

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75

80

Val Lys Asn Met Arg Thr Met Thr Tyr Asp Val Met Phe Asp Pro Leu

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90

95

Val Leu Leu Phe Ile Gly Ala Ser Tyr Val Leu Thr Leu Ala Met Gly

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105

110

Ala Phe Met Ile Ser Lys Gly Gln Val Thr Val Gly Asp Leu Val Thr

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120

125

Phe Val Thr Tyr Leu Asp Met Leu Val Trp Pro Leu Met Ala Ile Gly

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Thr Thr Val Val Lys Asn Ile Ile Pro Leu Ile Ala Ser His Phe Ile
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Asp His Tyr Leu Thr Asn Val Asn Gln Thr Ala Val Leu Ile Leu Val
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Gly Tyr Tyr Ser Met Tyr Val Leu Gln Thr Leu Ile Gln Tyr Phe Gly
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Asn Leu Phe Phe Ala Arg Val Ser Tyr Ser Ile Val Arg Asp Ile Arg
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Arg Asp Ala Phe Ala Asn Met Glu Arg Leu Gly Met Ser Tyr Phe Asp
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<213> Streptococcus agalactiae

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Val Thr Pro Ser Asp Met Pro Asp Thr Lys Gln Leu Val Ser Asp Glu
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Thr Asp Thr Gln Lys Gly Val Thr Glu Pro Asp Lys Ala Thr Ser Leu
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Leu Glu Glu Asn Lys Gly Pro Val Ser Asp Lys Asn Thr Leu Asp Leu
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Gln Ile Glu Asn Gly Tyr Phe Arg Leu His Leu Lys Glu Leu Pro Gln
 165 170 175

123456789101112131415161718192021222324252627282930313233343536373839404142434445464748495051525354555657585960616263646566676869707172737475767778798081828384858687888990919293949596979899100101102103104105106107108109110111112113114115116117118119120121122123124125126127128129130131132133134135136137138139140141142143144145146147148149150151152153154155156157158159160161162163164165166167168169170171172173174175176177178179180181182183184185186187188189190191192193194195196197198199200

Lys Asp Pro Lys Val Tyr Asn Asn Pro Tyr Tyr Ile Asp Gln Val Gln
370 375 380

Leu Lys Asp Ala Gln Gln Thr Asp Leu Thr Ser Ile Gln Ala Ser Phe
 385 390 395 400

Thr Thr Leu Asp Gly Val Asp Lys Thr Glu Ile Leu Lys Glu Leu Lys
 405 410 415

Val Thr Asp Lys Asn Gln Asn Ala Ile Gln Ile Ser Asp Ile Thr Leu
 420 425 430

Asp Thr Ser Lys Ser Leu Leu Ile Ile Lys Gly Asp Phe Asn Pro Lys
 435 440 445

Gln Gly His Phe Asn Ile Ser Tyr Asn Gly Asn Asn Val Thr Thr Arg
 450 455 460

Gln Ser Trp Glu Phe Lys Asp Gln Leu Tyr Ala Tyr Ser Gly Asn Leu
 465 470 475 480

Gly Ala Val Leu Asn Gln Asp Gly Ser Lys Val Glu Ala Ser Leu Trp
 485 490 495

Ser Pro Ser Ala Asp Ser Val Thr Met Ile Ile Tyr Asp Lys Asp Asn
 500 505 510

Gln Asn Arg Val Val Ala Thr Thr Pro Leu Val Lys Asn Asn Lys Gly
 515 520 525

Val Trp Gln Thr Ile Leu Asp Thr Lys Leu Gly Ile Lys Asn Tyr Thr
 530 535 540

Gly Tyr Tyr Tyr Leu Tyr Glu Ile Lys Arg Gly Lys Asp Lys Val Lys
 545 550 555 560

Ile Leu Asp Pro Tyr Ala Lys Ser Leu Ala Glu Trp Asp Ser Asn Thr
 565 570 575

Val Asn Asp Asp Ile Lys Thr Ala Lys Ala Ala Phe Val Asn Pro Ser
 580 585 590

Gln Leu Gly Pro Lys Asn Leu Ser Phe Ala Lys Ile Ala Asn Phe Lys	595	600	605
Gly Lys Gln Asp Ala Val Ile Tyr Glu Ala His Val Arg Asp Phe Thr	610	615	620
Ser Asp Gln Ser Leu Asp Gly Lys Leu Lys Asn Gln Leu Gly Thr Phe	625	630	635 640
Ala Ala Phe Ser Glu Lys Leu Asp Tyr Leu Gln Lys Leu Gly Val Thr	645	650	655
His Ile Gln Leu Leu Pro Val Leu Ser Tyr Phe Tyr Val Asn Glu Met	660	665	670
Asp Lys Ser Arg Ser Thr Ala Tyr Thr Ser Ser Asp Asn Asn Tyr Asn	675	680	685
Trp Gly Tyr Asp Pro Gln Ser Tyr Phe Ala Leu Ser Gly Met Tyr Ser	690	695	700
Glu Lys Pro Lys Asp Pro Ser Ala Arg Ile Ala Glu Leu Lys Gln Leu	705	710	715 720
Ile His Asp Ile His Lys Arg Gly Met Gly Val Ile Leu Asp Val Val	725	730	735
Tyr Asn His Thr Ala Lys Thr Tyr Leu Phe Glu Asp Ile Glu Pro Asn	740	745	750
Tyr Tyr His Phe Met Asn Glu Asp Gly Ser Pro Arg Glu Ser Phe Gly	755	760	765
Gly Gly Arg Leu Gly Thr Thr His Ala Met Ser Arg Arg Val Leu Val	770	775	780
Asp Ser Ile Lys Tyr Leu Thr Ser Glu Phe Lys Val Asp Gly Phe Arg	785	790	795 800

Phe Asp Met Met Gly Asp His Asp Ala Ala Ala Ile Glu Leu Ala Tyr	805	810	815
Lys Glu Ala Lys Ala Ile Asn Pro Asn Met Ile Met Ile Gly Glu Gly	820	825	830
Trp Arg Thr Phe Gln Gly Asp Gln Gly Lys Pro Val Lys Pro Ala Asp	835	840	845
Gln Asp Trp Met Lys Ser Thr Asp Thr Val Gly Val Phe Ser Asp Asp	850	855	860
Ile Arg Asn Ser Leu Lys Ser Gly Phe Pro Asn Glu Gly Thr Pro Ala	865	870	875
Phe Ile Thr Gly Gly Pro Gln Ser Leu Gln Gly Ile Phe Lys Asn Ile	885	890	895
Lys Ala Gln Pro Gly Asn Phe Glu Ala Asp Ser Pro Gly Asp Val Val	900	905	910
Gln Tyr Ile Ala Ala His Asp Asn Leu Thr Leu His Asp Val Ile Ala	915	920	925
Lys Ser Ile Asn Lys Asp Pro Lys Val Ala Glu Glu Asp Ile His Arg	930	935	940
Arg Leu Arg Leu Gly Asn Val Met Ile Leu Thr Ser Gln Gly Thr Ala	945	950	955
Phe Ile His Ser Gly Gln Glu Tyr Gly Arg Thr Lys Arg Leu Leu Asn	965	970	975
Pro Asp Tyr Met Thr Lys Val Ser Asp Asp Lys Leu Pro Asn Lys Ala	980	985	990
Thr Leu Ile Glu Ala Val Lys Glu Tyr Pro Tyr Phe Ile His Asp Ser	995	1000	1005

Tyr Asp Ser Ser Asp Ala Ile Asn His Phe Asp Trp Ala Ala Ala Thr
 1010 1015 1020

Asp Asn Asn Lys His Pro Ile Ser Thr Lys Thr Gln Ala Tyr Thr Ala
 1025 1030 1035 1040

Gly Leu Ile Thr Leu Arg Arg Ser Thr Asp Ala Phe Arg Lys Leu Ser
 1045 1050 1055

Lys Ala Glu Ile Asp Arg Glu Val Ser Leu Ile Thr Glu Val Gly Gln
 1060 1065 1070

Gly Asp Ile Lys Glu Lys Asp Leu Val Ile Ala Tyr Gln Thr Ile Asp
 1075 1080 1085

Ser Lys Gly Asp Ile Tyr Ala Val Phe Val Asn Ala Asp Ser Lys Ala
 1090 1095 1100

Arg Asn Val Leu Leu Gly Glu Lys Tyr Lys His Leu Leu Lys Gly Gln
 1105 1110 1115 1120

Val Ile Val Asp Ala Asp Gln Ala Gly Ile Lys Pro Ile Ser Thr Pro
 1125 1130 1135

Arg Gly Val His Phe Glu Lys Asp Ser Leu Leu Ile Asp Pro Leu Thr
 1140 1145 1150

Ala Ile Val Ile Lys Val Gly Lys Val Ala Pro Ser Pro Lys Glu Glu
 1155 1160 1165

Leu Gln Ala Asp Tyr Pro Lys Thr Gln Ser Phe Lys Gly Ser Lys Thr
 1170 1175 1180

Val Glu Lys Val Asn Arg Ile Ala Asn Lys Thr Ser Ile Thr Pro Val
 1185 1190 1195 1200

Val Ser Asn Lys Thr Asp Ser Tyr Leu Thr Asn Glu Ala Asn Leu Pro
 1205 1210 1215

1010 1015 1020
 1025 1030 1035 1040
 1045 1050 1055
 1060 1065 1070
 1075 1080 1085
 1090 1095 1100
 1105 1110 1115 1120
 1125 1130 1135
 1140 1145 1150
 1155 1160 1165
 1170 1175 1180
 1185 1190 1195 1200
 1205 1210 1215

Lys Thr Gly Asp Lys Ser Ser Lys Ile Leu Ser Val Val Gly Ile Ser
 1220 1225 1230

Ile Leu Ala Ser Leu Leu Ala Leu Leu Gly Leu Ser Leu Lys Arg Asn
 1235 1240 1245

Arg Thr
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<210> 11

<211> 921

<212> DNA

<213> Streptococcus agalactiae

<400> 11

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 ccacatacct ggacggatcc cgttttagct ggtgaggaag ctgttaatat cgctaaagag 480
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 cttggtatct cgggtatttc tccagagcaa gagccctctc ctgcgaatt gaaagaaatt 720
 caagactttg ttaaagaata caacgtcaag actatttttg cagaagacaa cgtcaacccc 780
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<211> 306

<212> PRT

<213> Streptococcus agalactiae

<400> 12

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20 25 30

Met Ser Val Val Thr Ser Phe Tyr Pro Met Tyr Ala Met Thr Lys Glu
35 40 45

Val Ser Gly Asp Leu Asn Asp Val Arg Met Ile Gln Ser Gly Ala Gly
50 55 60

Ile His Ser Phe Glu Pro Ser Val Asn Asp Val Ala Ala Ile Tyr Asp
65 70 75 80

Ala Asp Leu Phe Val Tyr Gln Ser His Thr Leu Glu Ala Trp Ala Arg
85 90 95

Asp Leu Asp Pro Asn Leu Lys Lys Ser Lys Val Asn Val Phe Glu Ala
100 105 110

Ser Lys Pro Leu Thr Leu Asp Arg Val Lys Gly Leu Glu Asp Met Glu
115 120 125

Val Thr Gln Gly Ile Asp Pro Ala Thr Leu Tyr Asp Pro His Thr Trp
130 135 140

Thr Asp Pro Val Leu Ala Gly Glu Glu Ala Val Asn Ile Ala Lys Glu
145 150 155 160

Leu Gly His Leu Asp Pro Lys His Lys Asp Ser Tyr Thr Lys Lys Ala
165 170 175

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gtgctaggat caactattat tttaggatca agtcctgtat ctgctatgga tagtggttga 120
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<210> 14

<212> PRT

<213> Streptococcus agalactiae .

<400> 14

Met Phe Asn Lys Ile Gly Phe Arg Thr Trp Lys Ser Gly Lys Leu Trp
1 5 10 15

Leu Tyr Met Gly Val Leu Gly Ser Thr Ile Ile Leu Gly Ser Ser Pro
20 25 30

Val Ser Ala Met Asp Ser Val Gly Asn Gln Ser Gln Gly Asn Val Leu
35 40 45

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
50 55 60

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
65 70 75 80

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
85 90 95

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
100 105 110

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attaaaaaag	aaaaaagaga	caagccggat	aataaaaagc	aaatcagcga	gacacttaaa	180
gttcctttta	aacccaaaaa	agtagttggt	tttgatatgg	gagctttgga	tactatcaca	240
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ttgcccaata	acgtcaaatc	tgtttataaa	gctaagagat	accaagacgt	aggaagtctc	360
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cgtatggctt	ctgttgataa	tattgaaaaa	ttaaaggagg	ctgcacctaa	agcagcatta	480
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<210> 16

<212> PRT

<213> Streptococcus agalactiae

<400> 16

Thr Thr Ser Gln Ala Val Leu Ala Lys Glu Lys Ser Gln Thr Val Thr
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Ile Lys Asn Asn Tyr Ser Val Tyr Ile Lys Lys Glu Lys Arg Asp Lys
35 40 45

Pro Asp Asn Lys Lys Gln Ile Ser Glu Thr Leu Lys Val Pro Leu Lys
50 55 60

Pro Lys Lys Val Val Val Phe Asp Met Gly Ala Leu Asp Thr Ile Thr
65 70 75 80

Ala Leu Gly Ala Glu Lys Ser Val Ile Gly Ile Pro Lys Ala Lys Asn
85 90 95

Ala Leu Ser Leu Leu Pro Asn Asn Val Lys Ser Val Tyr Lys Ala Lys
100 105 110

Arg Tyr Gln Asp Val Gly Ser Leu Phe Glu Pro Asn Phe Glu Ala Ile	115	120	125
Ala Arg Met Gln Pro Asp Val Val Phe Leu Gly Ala Arg Met Ala Ser	130	135	140
Val Asp Asn Ile Glu Lys Leu Lys Glu Ala Ala Pro Lys Ala Ala Leu	145	150	155 160
Val Tyr Ala Gly Val Asp Ser Lys Lys Val Phe Asp Lys Gly Val Ala	165	170	175
Glu Arg Val Thr Met Leu Gly Lys Ile Phe Asp Gln Asn Lys Lys Ala	180	185	190
Lys Thr Phe Asn Lys Asp Ile Ala Gln Ala Val Leu Lys Leu Gln Lys	195	200	205
Thr Ile Glu Lys Lys Gly Lys Pro Thr Ala Leu Phe Val Met Ala Asn	210	215	220
Ser Gly Glu Leu Leu Thr Gln Ser Pro Ser Gly Arg Phe Gly Trp Ile	225	230	235 240
Phe Ser Val Gly Gly Phe Lys Ala Val Asn Glu Asn Glu Lys Leu Ser	245	250	255
Ser His Gly Thr Pro Val Ser Tyr Glu Tyr Ile Ala Glu Lys Asn Pro	260	265	270
Asn Tyr Leu Phe Val Leu Asp Arg Gly Ala Thr Ile Gly Gln Gly Ala	275	280	285
Ser Ser Lys Glu Leu Phe Asn Asn Asp Val Ile Lys Ala Thr Asp Ala	290	295	300
Val Lys Asn Lys Arg Val His Glu Val Asp Gly Lys Asp Trp Tyr Ile	305	310	315 320

Asn Phe Val Asp Asn Arg
340

<213> Streptococcus agalactiae

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aaccottaa

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<210> 18

<211> 822

<212> PRT

<213> Streptococcus agalactiae

<400> 18

Met Lys Lys Thr Tyr Gly Tyr Ile Gly Ser Val Ala Ala Ile Leu Leu

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Ala Thr His Ile Gly Ser Tyr Gln Leu Gly Lys His His Met Gly Leu

20 25 30

Ala Thr Lys Asp Asn Gln Ile Ala Tyr Ile Asp Asp Ser Lys Gly Lys

35 40 45

Val Lys Ala Pro Lys Thr Asn Lys Thr Met Asp Gln Ile Ser Ala Glu

50 55 60

Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly	65	70	75	80
Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val	85	90	95	
Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Thr Asp Pro Asn	100	105	110	
Tyr His Phe Lys Gln Ser Asp Val Ile Asn Glu Ile Leu Asp Gly Tyr	115	120	125	
Val Ile Lys Val Asn Gly Asn Tyr Tyr Val Tyr Leu Lys Pro Gly Ser	130	135	140	
Lys Arg Lys Asn Ile Arg Thr Lys Gln Gln Ile Ala Glu Gln Val Ala	145	150	155	160
Lys Gly Thr Lys Glu Ala Lys Glu Lys Gly Leu Ala Gln Val Ala His	165	170	175	
Leu Ser Lys Glu Glu Val Ala Ala Val Asn Glu Ala Lys Arg Gln Gly	180	185	190	
Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Ser Pro Thr Asp Ile Ile	195	200	205	
Asp Asp Leu Gly Asp Ala Tyr Leu Val Pro His Gly Asn His Tyr His	210	215	220	
Tyr Ile Pro Lys Lys Asp Leu Ser Pro Ser Glu Leu Ala Ala Ala Gln	225	230	235	240
Ala Tyr Trp Ser Gln Lys Gln Gly Arg Gly Ala Arg Pro Ser Asp Tyr	245	250	255	
Arg Pro Thr Pro Ala Pro Gly Arg Arg Lys Ala Pro Ile Pro Asp Val	260	265	270	

Thr	Pro	Asn	Pro	Gly	Gln	Gly	His	Gln	Pro	Asp	Asn	Gly	Gly	Tyr	His
		275						280							285
Pro	Ala	Pro	Pro	Arg	Pro	Asn	Asp	Ala	Ser	Gln	Asn	Lys	His	Gln	Arg
		290				295					300				
Asp	Glu	Phe	Lys	Gly	Lys	Thr	Phe	Lys	Glu	Leu	Leu	Asp	His	Leu	His
					310					315					320
Arg	Leu	Asp	Leu	Lys	Tyr	Arg	His	Val	Glu	Glu	Asp	Gly	Leu	Ile	Phe
				325					330					335	
Glu	Pro	Thr	Gln	Val	Ile	Lys	Ser	Asn	Ala	Phe	Gly	Tyr	Val	Val	Pro
			340					345					350		
His	Gly	Asp	His	Tyr	His	Ile	Ile	Pro	Arg	Ser	Gln	Leu	Ser	Pro	Leu
		355					360					365			
Glu	Met	Glu	Leu	Ala	Asp	Arg	Tyr	Leu	Ala	Gly	Gln	Thr	Asp	Asp	Asn
		370				375					380				
Asp	Ser	Gly	Ser	Asp	His	Ser	Lys	Pro	Ser	Asp	Lys	Glu	Val	Thr	His
		385			390					395					400
Thr	Phe	Leu	Gly	His	Arg	Ile	Lys	Ala	Tyr	Gly	Lys	Gly	Leu	Asp	Gly
				405					410					415	
Lys	Pro	Tyr	Asp	Thr	Ser	Asp	Ala	Tyr	Val	Phe	Ser	Lys	Glu	Ser	Ile
			420					425					430		
His	Ser	Val	Asp	Lys	Ser	Gly	Val	Thr	Ala	Lys	His	Gly	Asp	His	Phe
		435					440					445			
His	Tyr	Ile	Gly	Phe	Gly	Glu	Leu	Glu	Gln	Tyr	Glu	Leu	Asp	Glu	Val
		450				455					460				
Ala	Asn	Trp	Val	Lys	Ala	Lys	Gly	Gln	Ala	Asp	Glu	Leu	Val	Ala	Ala
		465				470				475					480

Pro Arg Asp Val Leu Ala Lys Glu Thr Phe Val Trp Lys Asp Gly Ser
675 680 685

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<210> 20
<211> 312
<212> PRT
<213> Streptococcus agalactiae
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Pro Met Pro Tyr Leu Phe Asn Ser Leu Gly Leu Asn Val Ile Val Leu

Leu Gly Ile Ser Ile Trp Gln Tyr Ser Arg Tyr Arg Lys Lys Met Leu

His Leu Lys Tyr Phe Asn Ser Ser Gln Asp Pro Ser Phe Glu Leu Gln

65 70 75 80

Pro Ser Asp Tyr Ala Tyr Phe Asn Ile Ile Thr Gln Leu Glu Ala Arg

85 90 95

Glu Ala Gln Lys Val Ser Glu Thr Ile Glu Gln Thr Asn His Val Ala
 100 105 110

Leu Met Ile Lys Met Trp Ser His Gln Met Lys Val Pro Leu Ala Ala
 115 120 125

Ile Ser Leu Met Ala Gln Thr Asn His Leu Asp Pro Lys Glu Val Glu
 130 135 140

Gln Gln Leu Leu Lys Leu Gln His Tyr Leu Glu Thr Leu Leu Ala Phe
 145 150 155 160

Leu Lys Phe Arg Gln Tyr Arg Asp Asp Phe Arg Phe Glu Ala Val Ser
 165 170 175

Leu Arg Glu Val Val Val Glu Ile Ile Lys Ser Tyr Lys Val Ile Cys
 180 185 190

Leu Ser Lys Ser Leu Ser Ile Ile Ile Glu Gly Asp Asn Ile Trp Lys
 195 200 205

Thr Asp Lys Lys Trp Leu Thr Phe Ala Leu Ser Gln Val Leu Asp Asn
 210 215 220

Ala Ile Lys Tyr Ser Asn Pro Glu Ser Lys Ile Ile Ile Ser Ile Gly
 225 230 235 240

Glu Glu Ser Ile Arg Ile Gln Asp Tyr Gly Ile Gly Ile Leu Glu Glu
 245 250 255

Asp Ile Pro Arg Leu Phe Glu Asp Gly Phe Thr Gly Tyr Asn Gly His
 260 265 270

Glu His Gln Lys Ala Thr Gly Met Gly Leu Tyr Met Thr Lys Glu Val
 275 280 285

Leu Ser Ser Leu Asn Leu Ser Ile Ser Val Asp Ser Lys Ile Asn Tyr
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Gly Thr Ala Val Ser Ile His Lys

305

310

<210> 21

<211> 942

<212> DNA

<213> Streptococcus agalactiae

<400> 21

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 aatcatatta attatatgac ctatgctcgt tatttcatac ctcagtacat ctcagctgat 300
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 ggttttgata tgggagctgc tatcgatggg cataaattta tttttgacat cccaattacc 660
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 atgagactcc gtgaggtatg gtggcactat aatttacttg aatggtcaag tatcatatct 780
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 cttattgcta caacttctga ttgtatacca tctatctcag aattagtcac tgcccttcca 900
 gattgtctat ttcacattgc atgcaccaac agttatgtct ga 942

<210> 22

<211> 313

<212> PRT

<213> Streptococcus agalactiae

<400> 22

Met Thr Tyr Gln Lys Thr Val Val Leu Ala Gly Asp Tyr Ser Tyr Ile

1

5

10

15

Asp Gly His Lys Phe Ile Phe Asp Ile Pro Ile Thr Pro Leu Pro Lys
210 215 220

Ile Ile His Tyr Ile Ser Gly Ile Lys Pro Trp Gln Thr Leu Ser Asn
225 230 235 240

Met Arg Leu Arg Glu Val Trp Trp His Tyr Asn Leu Leu Glu Trp Ser
245 250 255

Ser Ile Ile Ser Ser Lys Lys Val Phe Gly Leu Asp His Pro Ile Lys
260 265 270

Thr Gln Asn Tyr Arg Leu Asn Phe Leu Ile Ala Thr Thr Ser Asp Cys
275 280 285

Ile Pro Ser Ile Ser Glu Leu Val Thr Ala Leu Pro Asp Cys Leu Phe
290 295 300

His Ile Ala Cys Thr Asn Ser Tyr Val
305 310

<210> 23

<211> 1146

<212> DNA

<213> Streptococcus agalactiae

<400> 23

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tatattgatg atagcaaagg taaggtaaaa gccctaaaa caaacaaaac gatggatcaa 180
atcagtgtg aagaaggcat ctctgtgaa cagatcgtag tcaaaattac tgaccaaggt 240
tatgttacct cacacggtga ccattatcat ttttacaatg ggaaagttcc ttatgatgcg 300
attattagtg aagagttggt gatgacggat cctaattacc attttaaaca atcagacgtt 360
atcaatgaaa tcttagacgg ttacgttatt aaagtcaatg gcaactatta tgtttacctc 420
aagccaggta gtaagcgcaa aaacattcga accaaacaac aaattgctga gcaagtagcc 480
aaaggaacta aagaagctaa agaaaaaggt ttagctcaag tggcccatct cagtaaagaa 540
gaagttgctg cagtcaatga agcaaaaaga caaggacgct atactacaga cgatggctat 600
atttttagtc cgacagatat cattgatgat ttaggagatg cttatttagt acctcatggt 660
aatcactatc attatattcc taaaaaagat ttgtctccaa gtgagctagc tgctgcacaa 720

gcctactgga gtcaaaaaca aggtcgaggt gctagaccgt ctgattaccg cccgacacca 780
 gccccaggtc gtaggaaagc cccacttcct gatgtgacgc ctaaccctgg acaagggtcat 840
 cagccagata acggtgggta tcatccagcg cctcctaggc caaatgatgc gtcacaaaac 900
 aaacaccaaaa gagatgagtt taaaggaaaa acctttaagg aactttttaga tcaactacac 960
 cgtotttgatt tgaaataccg tcatgtggaa gaagatgggt tgatttttga accgactcaa 1020
 gtgatcaaatt caaacgcttt tgggtatgtg gtgcctcatg gagatcatta tcatattatc 1080
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 aactga 1146

<210> 24

<211> 381

<212> PRT

<213> Streptococcus agalactiae

<400> 24

Met Lys Lys Thr Tyr Cys Tyr Ile Gly Ser Val Ala Ala Ile Leu Leu
 1 5 10 15

Ala Thr His Ile Gly Ser Tyr Gln Leu Gly Lys His His Met Gly Leu
 20 25 30

Ala Thr Lys Asp Asn Gln Ile Ala Tyr Ile Asp Asp Ser Lys Gly Lys
 35 40 45

Val Lys Ala Pro Lys Thr Asn Lys Thr Met Asp Gln Ile Ser Ala Glu
 50 55 60

Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly
 65 70 75 80

Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val
 85 90 95

Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Thr Asp Pro Asn
 100 105 110

09750744:043304

Tyr	His	Phe	Lys	Gln	Ser	Asp	Val	Ile	Asn	Glu	Ile	Leu	Asp	Gly	Tyr	
			115					120					125			
Val	Ile	Lys	Val	Asn	Gly	Asn	Tyr	Tyr	Val	Tyr	Leu	Lys	Pro	Gly	Ser	
	130					135					140					
Lys	Arg	Lys	Asn	Ile	Arg	Thr	Lys	Gln	Gln	Ile	Ala	Glu	Gln	Val	Ala	
145					150					155					160	
Lys	Gly	Thr	Lys	Glu	Ala	Lys	Glu	Lys	Gly	Leu	Ala	Gln	Val	Ala	His	
				165					170					175		
Leu	Ser	Lys	Glu	Glu	Val	Ala	Ala	Val	Asn	Glu	Ala	Lys	Arg	Gln	Gly	
			180					185					190			
Arg	Tyr	Thr	Thr	Asp	Asp	Gly	Tyr	Ile	Phe	Ser	Pro	Thr	Asp	Ile	Ile	
	195						200						205			
Asp	Asp	Leu	Gly	Asp	Ala	Tyr	Leu	Val	Pro	His	Gly	Asn	His	Tyr	His	
	210					215					220					
Tyr	Ile	Pro	Lys	Lys	Asp	Leu	Ser	Pro	Ser	Glu	Leu	Ala	Ala	Ala	Gln	
225					230					235					240	
Ala	Tyr	Trp	Ser	Gln	Lys	Gln	Gly	Arg	Gly	Ala	Arg	Pro	Ser	Asp	Tyr	
				245				250						255		
Arg	Pro	Thr	Pro	Ala	Pro	Gly	Arg	Arg	Lys	Ala	Pro	Leu	Pro	Asp	Val	
		260					265						270			
Thr	Pro	Asn	Pro	Gly	Gln	Gly	His	Gln	Pro	Asp	Asn	Gly	Gly	Tyr	His	
		275					280					285				
Pro	Ala	Pro	Pro	Arg	Pro	Asn	Asp	Ala	Ser	Gln	Asn	Lys	His	Gln	Arg	
	290					295					300					
Asp	Glu	Phe	Lys	Gly	Lys	Thr	Phe	Lys	Glu	Leu	Leu	Asp	Gln	Leu	His	
305					310				315						320	

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<210> 26
<211> 219
<212> PRT
<213> Streptococcus agalactiae
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Met Val Asn Asp Ile Leu Glu Arg Met Tyr Lys Glu Asn Ile Pro Lys
1 5 10 15

Thr Tyr Ser Phe Ser Met Thr Gly Gly Gln Gln Ile Asp Gly Val Lys
35 40 45

Asp Ile Ala Glu Leu Tyr Gln Lys Tyr Ser Lys Glu Glu Leu Ala Asn
65 70 75 80

Leu Gly Ile Asn Ile Tyr Gln Ser Asn Asp Ile Glu Arg Thr Glu Glu
85 90 95

Arg Thr Phe Asp Glu Ile Ile Ser Trp Val Ser Asn Pro Tyr Ala Thr
100 105 110

Arg Pro Ile Gln Glu Arg His Thr Ile Gln Leu Glu Pro Thr Arg Phe
115 120 125

Ser Leu Glu Asp Lys Lys Arg Ile Glu Glu Ala Ala Ala Gln Gly Leu
130 135 140

Ser Glu Ile Asp Leu Ile Asp Leu Val Asp Leu Tyr Asp Ile Asn Leu
145 150 155 160

Asp Asn Thr Ser Val Asn Arg His Ile Val Gly Leu Leu Thr Asn Asn
165 170 175

Thr Gln Val Thr Tyr Tyr Phe Gln Glu Gln Leu Asn Lys Glu Leu Leu
180 185 190

Ser Met Ala His Ala Leu Asp Asn Val Gln Gln Ala Phe Ile Lys Leu
 195 200 205

Leu Ser Glu Glu Glu Ile Arg Lys Phe Ala Leu
 210 215

<210> 27

<211> 653

<212> DNA

<213> Streptococcus agalactiae

<400> 27

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 gctatcactt tagtagccct tttttcatgt attttggtg taacgggtcat ctttaaaagt 120
 tcacaagtta ctactgaatc tttgtcaaaa gcagataaag ttcgcgtagc caaaaaatca 180
 aaaatgacta aggcgacatc taaatcaaaa gtagaagatg taaaacaggc tccaaaacct 240
 tctcaggcat ctaatgaagc cccaaaatca agttctcaat ctacagaagc taattctcag 300
 caacaagtta ctgcgagtga agaggcggct gtagaacaag cagttgtaac agaaaatacc 360
 cctgctacca gtcaggcaca acaaacttat gctgttactg agacaactta caaacctgct 420
 caacaccaga caagtggcca agtattgagc aatggaaata ctgcaggggc ggtcggatct 480
 gctgctgcag cacaaatggc tgctgcaaca ggagtcocctc agtctacttg ggaacatatt 540
 attgcccggtg aatcaaattg taatcctaatt gttgctaatt cctcaggggc ttcaggactt 600
 ttccaaacga tgccaggttg gggttcaaca gctacagttc aggatcaagt taa 653

<210> 28

<211> 234

<212> PRT

<213> Streptococcus agalactiae

<400> 28

Met Asn Lys Arg Arg Lys Leu Ser Lys Leu Asn Val Lys Lys Gln His
 1 5 10 15

Leu Ala Tyr Gly Ala Ile Thr Leu Val Ala Leu Phe Ser Cys Ile Leu
 20 25 30

105240-4423400

Arg Ala Gln Gly Leu Ser Ala Trp Gly Tyr
225 230

<210> 29

<211> 360

<212> DNA

<213> Streptococcus agalactiae

<400> 29

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atgattgttg gacacggaat tgatttacia gagatagagg cgattactaa agcatatgag 60
cgtaatcaac gttttgcaga acgcgttttg accgaacaag aattgcttct ttttaaagga 120
atttccaatc ccaagcgtca gatgtctttt ttaacagggc gatgggcagc aaaagaggct 180
tatagcaaag cacttggaac aggaattggg aaagttaatt ttcattgatat cgaaatttta 240
tcggatgata aaggagcgcc tttgattaca aaagaaccgt ttaatggaaa atcttttggt 300
tcaatatctc atagtggtaa ttatgcacaa gctagtgtta ttttggagga agaaaaatga 360

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<210> 30

<211> 119

<212> PRT

<213> Streptococcus agalactiae

<400> 30

Met Ile Val Gly His Gly Ile Asp Leu Gln Glu Ile Glu Ala Ile Thr

1 5 10 15

Lys Ala Tyr Glu Arg Asn Gln Arg Phe Ala Glu Arg Val Leu Thr Glu

20 25 30

Gln Glu Leu Leu Leu Phe Lys Gly Ile Ser Asn Pro Lys Arg Gln Met

35 40 45

Ser Phe Leu Thr Gly Arg Trp Ala Ala Lys Glu Ala Tyr Ser Lys Ala

50 55 60

Leu Gly Thr Gly Ile Gly Lys Val Asn Phe His Asp Ile Glu Ile Leu

65 70 75 80

Ser Asp Asp Lys Gly Ala Pro Leu Ile Thr Lys Glu Pro Phe Asn Gly

85

90

95

Lys Ser Phe Val Ser Ile Ser His Ser Gly Asn Tyr Ala Gln Ala Ser

100

105

110

Val Ile Leu Glu Glu Glu Lys

115

<210> 31

<211> 474

<212> DNA

<213> Streptococcus agalactiae

<400> 31

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 gacttcgaac ctcagaattg tcagtgggtca aaatttctct catatgatga tatgaactct 180
 tacatgaaag aagctgagat tggtatcaca catggcggcc cagcgacgtt tatgtcagtt 240
 atttcttttag ggaaattacc agttgttggt cctaggagaa agcagtttgg tgaacatatc 300
 aatgatcatc aaatacaatt tttaaaaaaa attgcccacc tgtatccctt ggcttggatt 360
 gaagatgtag atggacttgc ggaagcgttg aaaaggaata tagctacaga aaaatatcag 420
 ggaaataatg atatgttttg tcataaatta gaaaaaatta taggtgaaat atga 474

<210> 32

<211> 157

<212> PRT

<213> Streptococcus agalactiae

<400> 32

Met Ile Phe Val Thr Val Gly Thr His Glu Gln Gln Phe Asn Arg Leu

1

5

10

15

Ile Lys Glu Val Asp Arg Leu Lys Gly Thr Gly Ala Ile Asp Gln Glu

20

25

30

Val Phe Ile Gln Thr Gly Tyr Ser Asp Phe Glu Pro Gln Asn Cys Gln
 35 40 45

Trp Ser Lys Phe Leu Ser Tyr Asp Asp Met Asn Ser Tyr Met Lys Glu
 50 55 60

Ala Glu Ile Val Ile Thr His Gly Gly Pro Ala Thr Phe Met Ser Val
 65 70 75 80

Ile Ser Leu Gly Lys Leu Pro Val Val Val Pro Arg Arg Lys Gln Phe
 85 90 95

Gly Glu His Ile Asn Asp His Gln Ile Gln Phe Leu Lys Lys Ile Ala
 100 105 110

His Leu Tyr Pro Leu Ala Trp Ile Glu Asp Val Asp Gly Leu Ala Glu
 115 120 125

Ala Leu Lys Arg Asn Ile Ala Thr Glu Lys Tyr Gln Gly Asn Asn Asp
 130 135 140

Met Phe Cys His Lys Leu Glu Lys Ile Ile Gly Glu Ile
 145 150 155

<210> 33

<211> 1203

<212> DNA

<213> Streptococcus agalactiae

<400> 33

ttggaagaca aattattcaa caaacatttt ataggcatta ctatttttaa ctttattggt 60
 tatatggtct attatttggt caccgttatt atagctttta ttgcgactaa agagttaggt 120
 gtttagcacta gccaaacagg attagcaacg gggatttata ttgtagggac tttgattgct 180
 cgtcttatat ttggttaagca attagaagtt ctaggacgta agttagtttt acgtggaggg 240
 gctatttttt acttactaac aacttttagct tatttttata tgccaagtat cggagtaatg 300
 tatttagttc gtttctctaaa tgggttttggt tatggcgctg tgtcaacagc aactaatact 360


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attgtaacag cctatatacc agctgataaa agaggtgagg ggattaactt ttacggtcta 420
tcaacaagtt tagccgcagc tattggtcct tttgtaggaa ctttatgct agacaacctt 480
catattaact ttaaaatggt tattgtatta tgtagtattt taattgcat tgtagtgttg 540
ggagcatttg ttttcccagt caaaaatatt actttaaatc cagaacagtt agctaaatca 600
aaatcatgga ctattgatag tttcattgag aaaaaagcaa tttttatcac aattattgca 660
tttttgatgg gtatctccta tgcttcctg ttaggtttcc aaaaattata tacaacagaa 720
attaatttga tgacagtagg agcttatttc tttattgttt atgcacttgt catcacttta 780
accagaccat ctatgggaag attaattgac gctaagggag ataagtgggt gctttatcca 840
agttatctgt tcttaacttt gggacttgct ttattagggg gtgctatggg aagtgttacc 900
taccttctat caggtgcttt gattggtttt ggttatggca cctttatgtc ttgtggccaa 960
gcagcatcaa tcaaagggtg tgaggaacat cgtttcaata cagccatgtc aacttacatg 1020
ataggtcttg atttaggggt aggtgctgga ccttacattt tgggacttgt taaagatggg 1080
tttcttgagg ctggtgtgca atcctttaga gaattattct ggatagcagc gattattcct 1140
gttgtttgtg gtattctata tttcttaaaa tcatctagac aagttgaaac taaaactata 1200
taa 1203

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<210> 34

<211> 400

<212> PRT

<213> Streptococcus agalactiae

<400> 34

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Met Glu Asp Lys Leu Phe Asn Lys His Phe Ile Gly Ile Thr Ile Leu
  1             5             10             15

```

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Asn Phe Ile Val Tyr Met Val Tyr Tyr Leu Phe Thr Val Ile Ile Ala
      20             25             30

```

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Phe Ile Ala Thr Lys Glu Leu Gly Val Ser Thr Ser Gln Ala Gly Leu
      35             40             45

```

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Ala Thr Gly Ile Tyr Ile Val Gly Thr Leu Ile Ala Arg Leu Ile Phe
      50             55             60

```

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Gly Lys Gln Leu Glu Val Leu Gly Arg Lys Leu Val Leu Arg Gly Gly
      65             70             75             80

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Ala Ile Phe Tyr Leu Leu Thr Thr Leu Ala Tyr Phe Tyr Met Pro Ser
85 90 95

Ile Gly Val Met Tyr Leu Val Arg Phe Leu Asn Gly Phe Gly Tyr Gly
100 105 110

Val Val Ser Thr Ala Thr Asn Thr Ile Val Thr Ala Tyr Ile Pro Ala
115 120 125

Asp Lys Arg Gly Glu Gly Ile Asn Phe Tyr Gly Leu Ser Thr Ser Leu
130 135 140

Ala Ala Ala Ile Gly Pro Phe Val Gly Thr Phe Met Leu Asp Asn Leu
145 150 155 160

His Ile Asn Phe Lys Met Val Ile Val Leu Cys Ser Ile Leu Ile Ala
165 170 175

Ile Val Val Leu Gly Ala Phe Val Phe Pro Val Lys Asn Ile Thr Leu
180 185 190

Asn Pro Glu Gln Leu Ala Lys Ser Lys Ser Trp Thr Ile Asp Ser Phe
195 200 205

Ile Glu Lys Lys Ala Ile Phe Ile Thr Ile Ile Ala Phe Leu Met Gly
210 215 220

Ile Ser Tyr Ala Ser Val Leu Gly Phe Gln Lys Leu Tyr Thr Thr Glu
225 230 235 240

Ile Asn Leu Met Thr Val Gly Ala Tyr Phe Phe Ile Val Tyr Ala Leu
245 250 255

Val Ile Thr Leu Thr Arg Pro Ser Met Gly Arg Leu Met Asp Ala Lys
260 265 270

Gly Asp Lys Trp Val Leu Tyr Pro Ser Tyr Leu Phe Leu Thr Leu Gly
275 280 285

1456789101112131415161718192021222324252627282930313233343536373839404142434445464748495051525354555657585960616263646566676869707172737475767778798081828384858687888990919293949596979899100

Leu Ala Leu Leu Gly Ser Ala Met Gly Ser Val Thr Tyr Leu Leu Ser
 290 295 300

Gly Ala Leu Ile Gly Phe Gly Tyr Gly Thr Phe Met Ser Cys Gly Gln
 305 310 315 320

Ala Ala Ser Ile Lys Gly Val Glu Glu His Arg Phe Asn Thr Ala Met
 325 330 335

Ser Thr Tyr Met Ile Gly Leu Asp Leu Gly Leu Gly Ala Gly Pro Tyr
 340 345 350

Ile Leu Gly Leu Val Lys Asp Gly Phe Leu Gly Ala Gly Val Gln Ser
 355 360 365

Phe Arg Glu Leu Phe Trp Ile Ala Ala Ile Ile Pro Val Val Cys Gly
 370 375 380

Ile Leu Tyr Phe Leu Lys Ser Ser Arg Gln Val Glu Thr Lys Thr Ile
 385 390 395 400

<210> 35

<211> 393

<212> DNA

<213> Streptococcus agalactiae

<400> 35

atgaatagtg aacctaagag tcagtcaaac gaagtaaaaa atagcaagca atcagaagtg 60
 aagaaagata aaaaaatgac aaaaaaagaa caattagcct atctcaaaga gcatgagcaa 120
 gaaatcatag attatgtaaa attacataac aaccaaattg agtccggttca attcgattgg 180
 tcaagtgtaa aagtagaaca aagcgggaat ggaactccac aaggggggtga ttataatctt 240
 tcaactgagag gaaagtttaa tcatctacaa aattcaaaaat taatagttga tttttattta 300
 gctcataaaa atgatatccc aaatatcaaa tcaatgggaa tgctaaataa gccatatata 360

393

<213> Streptococcus agalactiae

Lys Asn Gly Ile Trp His Ile Tyr Glu
130 135

<210> 37

<211> 927

<212> DNA

<213> Streptococcus agalactiae

<400> 37

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atgaaaaaga ttcgattatc aaagtttatt aaaatgattg ttgttatttt gtttttaatt 60
agtgtagcag ctagttttta ttttttccac gttgcccag ttcgagatga taaatccttt 120
atttcaaagtg gtcaacgtaa gcctggaaac tctttatatg cttatgataa atcctttgat 180
aagctattaa agcaaaaaat agaaatgaca aacaaaaata taaagcaagt tgcttggtat 240
gttcctgctg ctaagaaaac tcataagaca gttgttgctg ttcattggtt tgccaatagc 300
aaagagaata tgaaggcata tggttggctg tttcataagt taggatacaa tgttccttatg 360
cctgacaaca ttgcacatgg tgaaagtcac gggcagttga taggctatgg ctggaacgac 420
cgcgagaaca ttatcaaagtg gacagaaatg atagtggata agaattccatc aagccaaatt 480
actttatttg gtgtttcaat ggggtggagca acagtcacga tggctagtgg tgaaaaatta 540
cctagtcagg ttgttaatat cattgaagat tgtggttatt ctagtgtttg ggatgaatta 600
aaatttcagg ctaaagagat gtatggttta ccagccttcc cactcttata tgaagtttca 660
acaatttcta aaatcagagc aggtttttcg tatggacaag caagtagtgt cgaacaattg 720
aaaaagaata atttaccagc cctctttatt catggtgata aggataattt tgttccaaca 780
agtatggttt atgacaacta taaagctaca gcaggtaaga aagagcttta tattgtaaaa 840
ggggcaaaac atgcgaaatc ttttgaaaca gagccagaaa aatatgagaa acgtatctct 900
agttttttga aaaaatatga aaaataa                                     927

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<210> 38

<211> 308

<212> PRT

<213> Streptococcus agalactiae

<400> 38

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Met Lys Lys Ile Arg Leu Ser Lys Phe Ile Lys Met Ile Val Val Ile
  1                   5                   10                   15

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```

Leu Phe Leu Ile Ser Val Ala Ala Ser Phe Tyr Phe Phe His Val Ala
    20                   25                   30

```

```

Gln Val Arg Asp Asp Lys Ser Phe Ile Ser Asn Gly Gln Arg Lys Pro
    35                   40                   45

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Gly	Asn	Ser	Leu	Tyr	Ala	Tyr	Asp	Lys	Ser	Phe	Asp	Lys	Leu	Leu	Lys
50						55					60				
Gln	Lys	Ile	Glu	Met	Thr	Asn	Gln	Asn	Ile	Lys	Gln	Val	Ala	Trp	Tyr
65					70					75					80
Val	Pro	Ala	Ala	Lys	Lys	Thr	His	Lys	Thr	Val	Val	Val	Val	His	Gly
				85					90					95	
Phe	Ala	Asn	Ser	Lys	Glu	Asn	Met	Lys	Ala	Tyr	Gly	Trp	Leu	Phe	His
			100					105						110	
Lys	Leu	Gly	Tyr	Asn	Val	Leu	Met	Pro	Asp	Asn	Ile	Ala	His	Gly	Glu
		115					120						125		
Ser	His	Gly	Gln	Leu	Ile	Gly	Tyr	Gly	Trp	Asn	Asp	Arg	Glu	Asn	Ile
	130					135					140				
Ile	Lys	Trp	Thr	Glu	Met	Ile	Val	Asp	Lys	Asn	Pro	Ser	Ser	Gln	Ile
145					150					155					160
Thr	Leu	Phe	Gly	Val	Ser	Met	Gly	Gly	Ala	Thr	Val	Met	Met	Ala	Ser
				165					170					175	
Gly	Glu	Lys	Leu	Pro	Ser	Gln	Val	Val	Asn	Ile	Ile	Glu	Asp	Cys	Gly
		180							185					190	
Tyr	Ser	Ser	Val	Trp	Asp	Glu	Leu	Lys	Phe	Gln	Ala	Lys	Glu	Met	Tyr
		195						200					205		
Gly	Leu	Pro	Ala	Phe	Pro	Leu	Leu	Tyr	Glu	Val	Ser	Thr	Ile	Ser	Lys
		210					215						220		
Ile	Arg	Ala	Gly	Phe	Ser	Tyr	Gly	Gln	Ala	Ser	Ser	Val	Glu	Gln	Leu
225					230					235					240
Lys	Lys	Asn	Asn	Leu	Pro	Ala	Leu	Phe	Ile	His	Gly	Asp	Lys	Asp	Asn
				245						250				255	

Phe Val Pro Thr Ser Met Val Tyr Asp Asn Tyr Lys Ala Thr Ala Gly
 260 265 270

Lys Lys Glu Leu Tyr Ile Val Lys Gly Ala Lys His Ala Lys Ser Phe
 275 280 285

Glu Thr Glu Pro Glu Lys Tyr Glu Lys Arg Ile Ser Ser Phe Leu Lys
 290 295 300

Lys Tyr Glu Lys
 305

<210> 39

<211> 546

<212> DNA

<213> Streptococcus agalactiae

<400> 39

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 atatctgaac aacttgattc aattcgccaa cagacattaa aaccagatta tgtattattg 120
 agggatgatt gttcaacgga tgaaacagtc aatgtcgtca ataactatat cgcaaaacat 180
 gagttagaag gctggaaaat tgtaaaaaac gacaaaaact taggctggcg tttaaatttt 240
 cgtcaattac ttattgatgt gttagcctat gaggttgact atgtcttttt tagtgatcaa 300
 gatgatattt ggtatcttga taaaaacgaa cgacagtttg ccattatgtc agataaccct 360
 caaattgagg ttttgagtgc agacgttgat atcaaaacga tgtctacaga agccagtgtt 420
 ccacattttc taactttttc ttctagtgat agaatcagtc agtatcctaa agtatatgat 480
 tatcaaacat tccgtcccg atggaccatt gctatgaaga gagattttgc gcaagctatc 540
 gcttga 546

<210> 40

<211> 181

<212> PRT

<213> Streptococcus agalactiae

<400> 40

Met Arg Ser Asn Met Val Lys Thr Ala Val Leu Met Ala Thr Tyr Asn
 1 5 10 15

Gly Glu Lys Phe Ile Ser Glu Gln Leu Asp Ser Ile Arg Gln Gln Thr
 20 25 30

Leu Lys Pro Asp Tyr Val Leu Leu Arg Asp Asp Cys Ser Thr Asp Glu
 35 40 45

Thr Val Asn Val Val Asn Asn Tyr Ile Ala Lys His Glu Leu Glu Gly
 50 55 60

Trp Lys Ile Val Lys Asn Asp Lys Asn Leu Gly Trp Arg Leu Asn Phe
 65 70 75 80

Arg Gln Leu Leu Ile Asp Val Leu Ala Tyr Glu Val Asp Tyr Val Phe
 85 90 95

Phe Ser Asp Gln Asp Asp Ile Trp Tyr Leu Asp Lys Asn Glu Arg Gln
 100 105 110

Phe Ala Ile Met Ser Asp Asn Pro Gln Ile Glu Val Leu Ser Ala Asp
 115 120 125

Val Asp Ile Lys Thr Met Ser Thr Glu Ala Ser Val Pro His Phe Leu
 130 135 140

Thr Phe Ser Ser Ser Asp Arg Ile Ser Gln Tyr Pro Lys Val Tyr Asp
 145 150 155 160

Tyr Gln Thr Phe Arg Pro Gly Trp Thr Ile Ala Met Lys Arg Asp Phe
 165 170 175

Ala Gln Ala Ile Ala

180

<210> 41

<211> 579

<212> DNA

<213> Streptococcus agalactiae

<400> 41

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tatattaatg ctgagggcga gagagtagtt attataatca tagattttgt ccgtagtggt 120
agtcctattt tatatcgtct atttatgatt ttacttgcac aagaagtacc tcacttgcac 180
gattacatct ataatgcaag agatgatcac tacgatactt ggaagtttaa agaattaaag 240
gagtcaaacc atccagtcct tttggcattc tctgaaagggt ggcacgatag tcgcttgact 300
tctaaaagcc ttgcagaatg tttacaatta accgaccttg atgaagaagt gaaatcgacc 360
atcattcaat taagacagtt cgaaaaatca gtcagaaatc ctttggctca cctgattaaa 420
ccttttgatg agcaagaact atatcgtaac actcaatttt cttctcaagc attttttagac 480
cagattatct tcttggcaaa ggtaattggt gttgagtatg atactgttaa ttttcactac 540
gatacggtta acaagcttat tataaagata cttgagtaa 579

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<210> 42

<211> 192

<212> PRT

<213> Streptococcus agalactiae

<400> 42

Met Ile His Glu Ile His Asp Cys Gln Phe Ile Glu Lys Gly Ser Tyr

1

5

10

15

Val Tyr Leu Asn Tyr Ile Asn Ala Glu Gly Glu Arg Val Val Ile Ile

20

25

30

Ile Ile Asp Phe Val Arg Ser Val Ser Pro Ile Leu Tyr Arg Leu Phe

35

40

45

Met Ile Leu Leu Ala Gln Glu Val Pro His Leu His Asp Tyr Ile Tyr
 50 55 60

Asn Ala Arg Asp Asp His Tyr Asp Thr Trp Lys Phe Lys Glu Leu Lys
 65 70 75 80

Glu Ser Asn His Pro Val Leu Leu Ala Phe Ser Glu Arg Trp His Asp
 85 90 95

Ser Arg Leu Thr Ser Lys Ser Leu Ala Glu Cys Leu Gln Leu Thr Asp
 100 105 110

Leu Asp Glu Glu Val Lys Ser Thr Ile Ile Gln Leu Arg Gln Phe Glu
 115 120 125

Lys Ser Val Arg Asn Pro Leu Ala His Leu Ile Lys Pro Phe Asp Glu
 130 135 140

Gln Glu Leu Tyr Arg Thr Thr Gln Phe Ser Ser Gln Ala Phe Leu Asp
 145 150 155 160

Gln Ile Ile Phe Leu Ala Lys Val Ile Gly Val Glu Tyr Asp Thr Val
 165 170 175

Asn Phe His Tyr Asp Thr Val Asn Lys Leu Ile Ile Lys Ile Leu Glu
 180 185 190

<210> 43

<211> 465

<212> DNA

<213> Streptococcus agalactiae

<400> 43

atggtaaaaag tttcaaattt agggatatcca cgtcttggtg aacagcgcga atggaagcaa 60
 gcgatcgaag ctttctgggc agggaatctt gaacaaaaag atttagaaaa acaactaaaa 120
 caattacgta tcaatcattt aaagaaacaa aaagaggcag gtattgacct tattccagtg 180

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ggggattttt ottggtatga tcatgttttg gatttgatcat ttcaattcaa tgtaatccca 240
aagcgtttcg atgagtatga gaggaattta gacctttatt ttgctattgc aagaggtgac 300
aaagataatg tcgcatcatc tatgaaaaag tggtttaata ccaactacca ctacatagtc 360
ccagaatggg aggttgagac taaacctcac ttgcagaata attacttact tgatctttat 420
ctagaagcta gggaagtagt tggtgataaa gcaaagccgg ttatc 465

```

<210> 44

<211> 159

<212> PRT

<213> Streptococcus agalactiae

<400> 44

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Met Glu Glu Ile Met Val Lys Val Ser Asn Leu Gly Tyr Pro Arg Leu
  1             5             10            15

```

```

Gly Glu Gln Arg Glu Trp Lys Gln Ala Ile Glu Ala Phe Trp Ala Gly
      20             25            30

```

```

Asn Leu Glu Gln Lys Asp Leu Glu Lys Gln Leu Lys Gln Leu Arg Ile
      35             40            45

```

```

Asn His Leu Lys Lys Gln Lys Glu Ala Gly Ile Asp Leu Ile Pro Val
      50             55            60

```

```

Gly Asp Phe Ser Cys Tyr Asp His Val Leu Asp Leu Ser Phe Gln Phe
      65             70            75            80

```

```

Asn Val Ile Pro Lys Arg Phe Asp Glu Tyr Glu Arg Asn Leu Asp Leu
      85             90            95

```

```

Tyr Phe Ala Ile Ala Arg Gly Asp Lys Asp Asn Val Ala Ser Ser Met
      100            105            110

```

```

Lys Lys Trp Phe Asn Thr Asn Tyr His Tyr Ile Val Pro Glu Trp Glu
      115            120            125

```

Trp Arg Lys Glu Lys Val Ile Lys Leu
35 40

<210> 47

<211> 669

<212> DNA

<213> Streptococcus agalactiae

<400> 47

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atgaacaaaa aaatttccgg gatcggcttg gcttcgattg cagtacttag tttagctgca 60
tgtggacatc gtggtgcttc taaatctggt ggtaaatacag atagcttgaa ggttgcaatg 120
gtaacagata ccggtggtgt tgatgataaa tcatttaacc aatctggttg ggaaggatatg 180
caagcttggg gcaagaagaa tggccttaaa aaaggagctg gttttgacta tttccaatcg 240
gcaagtgaat ctgattatgc aactaactta gatacagctg tgtctagtgg ttataaattg 300
attttcggta ttggattttc tcttcatgat gctattgata aagcagcaga caataacaaa 360
gatgttaatt acgtcatcgt tgatgatgtt attaaagga aagataatgt tgcaagtgtt 420
gtctttgcgg ataataaatc agcttactta gcaggatttg cagccgctaa aactacaaaa 480
acaaaaacag ttggctttgt aggtggtatg gaatctgagg ttattaccgc ttttgaaaaa 540
ggttttgaag cagggtgtcaa atcagttgat aaatcaatta aaattaaagt tgactatgct 600
ggttcattcg gtgatgctgc taagggtgta acaattgcag ccgcacaata tgcttctggc 660
gcagatatt
669

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<210> 48

<211> 223

<212> PRT

<213> Streptococcus agalactiae

<400> 48

Met Asn Lys Lys Ile Ser Gly Ile Gly Leu Ala Ser Ile Ala Val Leu

1 5 10 15

Ser Leu Ala Ala Cys Gly His Arg Gly Ala Ser Lys Ser Gly Gly Lys

20 25 30

Ser Asp Ser Leu Lys Val Ala Met Val Thr Asp Thr Gly Gly Val Asp

35 40 45

Asp Lys Ser Phe Asn Gln Ser Gly Trp Glu Gly Met Gln Ala Trp Gly

50 55 60

F09000-111209200

Lys Lys Asn Gly Leu Lys Lys Gly Ala Gly Phe Asp Tyr Phe Gln Ser
 65 70 75 80

Ala Ser Glu Ser Asp Tyr Ala Thr Asn Leu Asp Thr Ala Val Ser Ser
 85 90 95

Gly Tyr Lys Leu Ile Phe Gly Ile Gly Phe Ser Leu His Asp Ala Ile
 100 105 110

Asp Lys Ala Ala Asp Asn Asn Lys Asp Val Asn Tyr Val Ile Val Asp
 115 120 125

Asp Val Ile Lys Gly Lys Asp Asn Val Ala Ser Val Val Phe Ala Asp
 130 135 140

Asn Glu Ser Ala Tyr Leu Ala Gly Ile Ala Ala Ala Lys Thr Thr Lys
 145 150 155 160

Thr Lys Thr Val Gly Phe Val Gly Gly Met Glu Ser Glu Val Ile Thr
 165 170 175

Arg Phe Glu Lys Gly Phe Glu Ala Gly Val Lys Ser Val Asp Lys Ser
 180 185 190

Ile Lys Ile Lys Val Asp Tyr Ala Gly Ser Phe Gly Asp Ala Ala Lys
 195 200 205

Gly Lys Thr Ile Ala Ala Ala Gln Tyr Ala Ser Gly Ala Asp Ile
 210 215 220

<210> 49

<211> 609

<212> DNA

<213> Streptococcus agalactiae

<400> 49

atgttacatt ctaaaaaaat acatttcctta tcgcttattg ccgttctctc ttttagcaaca 60

00760744-04300

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<210> 50
<211> 202
<212> PRT
<213> Streptococcus agalactiae
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<400> 50
Met Leu His Ser Lys Lys Ile His Ser Leu Ser Leu Ile Ala Val Leu
  1             5             10             15

Ser Leu Ala Thr Tyr Thr Ser Leu Gln Pro Asn His Val Ala Ala Glu
          20             25             30

Gln Ser Gln Lys Thr Ser Thr Val Leu Met Ser Gln Lys Thr Ile Glu
          35             40             45

His Lys Leu Lys Val Ala Asp Lys Glu Ala Ala Pro Leu Tyr Ala Lys
  50             55             60

Ile Asp His Ile Gln Arg His Ile Glu Val Lys Lys Ala Lys Asp Leu
  65             70             75             80

Lys Val Ile Glu Leu Tyr Ile Asn Lys Asp Ile Asn Gln Leu Glu Lys
          85             90             95

Gln Asn Lys Arg Leu Leu Thr Lys Phe Tyr Thr Ser Ile Asp Asn Gln
          100            105            110

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ctgaattccc	aaaaacgcta	caatcaaaact	tggtatccta	cttatgggtt	ttctgatact	60
tatgcattca	tggttactaa	agagtttgcc	agacagaata	aaatcaccaa	gatctctgat	120
ctcaaaaagt	tatcaacaac	tatgaaggca	ggggttgata	gttcatggat	gaatcgcgag	180
ggagatggat	acactgattt	cgctaaaaca	tacggttttg	aattttcaca	tatttaccct	240
atgcaaattg	gcttagtcta	tgatgcggtt	gaaagtaaca	aaatgcaatc	tgtattaggc	300
tactccactg	acggtcgtat	ttcgagctat	gatttagaaa	ttttaaggga	tgataaaaaa	360
ttctttcctc	cttatgaagc	ctctatgggt	gtcaacaatt	ctatcatcaa	aaaagatcct	420
aaactaaaaa	aattactcca	tcgactcgat	ggtaaaatca	atttaaaaac	gatgcaaaac	480
cttaattata	tggtagatga	taaactttta	gaagcttggc	gtaatcatgg	tcatagctgt	540
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<211> 199

<213> Streptococcus agalactiae

Leu Asn Ser Gln Lys Arg Tyr Asn Gln Thr Trp Tyr Pro Thr Tyr Gly
1 5 10 15

Phe Ser Asp Thr Tyr Ala Phe Met Val Thr Lys Glu Phe Ala Arg Gln
20 25 30

Asn Lys Ile Thr Lys Ile Ser Asp Leu Lys Lys Leu Ser Thr Thr Met
35 40 45

Lys Ala Gly Val Asp Ser Ser Trp Met Asn Arg Glu Gly Asp Gly Tyr
50 55 60

Thr Asp Phe Ala Lys Thr Tyr Gly Phe Glu Phe Ser His Ile Tyr Pro
65 70 75 80

Met Gln Ile Gly Leu Val Tyr Asp Ala Val Glu Ser Asn Lys Met Gln
85 90 95

Ser Val Leu Gly Tyr Ser Thr Asp Gly Arg Ile Ser Ser Tyr Asp Leu
100 105 110

Glu Ile Leu Arg Asp Asp Lys Lys Phe Phe Pro Pro Tyr Glu Ala Ser
115 120 125

Met Val Val Asn Asn Ser Ile Ile Lys Lys Asp Pro Lys Leu Lys Lys
130 135 140

Leu Leu His Arg Leu Asp Gly Lys Ile Asn Leu Lys Thr Met Gln Asn
145 150 155 160

Leu Asn Tyr Met Val Asp Asp Lys Leu Leu Glu Ala Trp Arg Asn His
165 170 175

Gly His Ser Cys Phe Leu Cys Glu Ile Val Ile Arg Ser Gln Phe His
 180 185 190

Thr Thr Tyr Glu Pro Glu Ala
 195

<210> 53

<211> 849

<212> DNA

<213> Streptococcus agalactiae

<400> 53

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 agtaaagaaa aggtgattac tgttgcaact tacagcaaac ctacatctac ctttttagat 180
 ttgattaaag ataatgtaaa agaaaaagga tatactttaa aggttgatcat ggtctctgac 240
 tatattcagg ctaacattgc tttagaaaac aaagaacatg atgctaacct tttaacaacat 300
 gaatttttca tgagtatctt taataaggaa aatgatggtc atctagtgtc aattacacca 360
 atttatcatt cattggctgg tttttatggc caacatttga aaaatattgc cgagcttaaa 420
 gacggtgcta aggtagcgat tccgtctgat cctgccata tgactagagc tctgctatta 480
 ttgcaagaaa agaaacttat caccttaaag aatacgtcca aaaagaccaa ggctatcgaa 540
 gatattatta ctaaccctaa aaaattacga attgaacctg tagcattact taacctcaat 600
 caggcctatt ttgaatatga ccttgtcttt aatttccttg gatatgtgac aaaaatcaat 660
 ctagttccta aaagggatag attattatat gagaaaaaac cagatatccg ttttgcaggt 720
 gccttggtag ctctgaaga taataaaaaat agtgataaaa taaaagtact taaagaagta 780
 ctaacaagta aagagattcg tcactatata actaaggaga ttccaagtga agcagacgtt 840
 gcgttctag 849

<210> 54

<211> 282

<212> PRT

<213> Streptococcus agalactiae

<400> 54

Met Lys Lys Leu Leu Ser Leu Thr Cys Leu Ile Met Met Ser Leu Cys
 1 5 10 15

Leu Val Ala Cys Thr Lys Gln Ala Met Ser Ser Lys Gln Ala Met Ser
 20 25 30

Ser Lys Gln Ile Lys Asp Lys Asn Ser Lys Glu Lys Val Ile Thr Val
 35 40 45

Ala Thr Tyr Ser Lys Pro Thr Ser Thr Phe Leu Asp Leu Ile Lys Asp
 50 55 60

Asn Val Lys Glu Lys Gly Tyr Thr Leu Lys Val Val Met Val Ser Asp
 65 70 75 80

Tyr Ile Gln Ala Asn Ile Ala Leu Glu Asn Lys Glu His Asp Ala Asn
 85 90 95

Leu Leu Gln His Glu Phe Phe Met Ser Ile Phe Asn Lys Glu Asn Asp
 100 105 110

Gly His Leu Val Ser Ile Thr Pro Ile Tyr His Ser Leu Ala Gly Phe
 115 120 125

Tyr Gly Gln His Leu Lys Asn Ile Ala Glu Leu Lys Asp Gly Ala Lys
 130 135 140

Val Ala Ile Pro Ser Asp Pro Ala Asn Met Thr Arg Ala Leu Leu Leu
 145 150 155 160

Leu Gln Glu Lys Lys Leu Ile Thr Leu Lys Asn Thr Ser Lys Lys Thr
 165 170 175

Lys Ala Ile Glu Asp Ile Ile Thr Asn Pro Lys Lys Leu Arg Ile Glu
 180 185 190

Pro Val Ala Leu Leu Asn Leu Asn Gln Ala Tyr Phe Glu Tyr Asp Leu
 195 200 205

Val Phe Asn Phe Pro Gly Tyr Val Thr Lys Ile Asn Leu Val Pro Lys
 210 215 220

Arg Asp Arg Leu Leu Tyr Glu Lys Lys Pro Asp Ile Arg Phe Ala Gly
 225 230 235 240

Ala Leu Val Ala Arg Glu Asp Asn Lys Asn Ser Asp Lys Ile Lys Val
 245 250 255

Leu Lys Glu Val Leu Thr Ser Lys Glu Ile Arg His Tyr Ile Thr Lys
 260 265 270

Glu Ile Pro Ser Glu Ala Asp Val Ala Phe
 275 280

<210> 55

<211> 711

<212> DNA

<213> Streptococcus agalactiae

<400> 55

ctgttggtcta aggaaccac tatgtctgtc ctttggtatc aaaattctgc agaagccaag 60
 gctttatatt tacaaggta taatgttgct aaaatgaagt tagatgattg gttacaaaag 120
 cccagtgaag aaccatattc aattatctta gatttagatg aaacagtttt agataatagc 180
 ccatatcaag caaagaatat taaagatggc tctagtttca cgccagagag ttgggataaa 240
 tgggtgcaaa agaaatcagc taaggctggt gcgggtgcc aagaattttt gaagtatgct 300
 aatgaaaagg gaataaaaat ttattatgtc tcagatcgta cagatgctca agttgatgctg 360
 actaaagaaa atttagagaa ggaagggtata cctgttcaag ggaaagacca cttgcttttc 420
 cttaaaaaag gaatgaaatc taaagagagt cgccgtcagg cagttcaaaa agataccaat 480
 ttaattatgc tttttggaga taatttagtt gattttgctg atttttctaa atcatctagt 540
 acagatagag aacaactact aactaaactt caaagtgagt ttggtagtaa atttattggt 600
 ttcccaaata ctatgtacgg ttcttgggaa agtgctatct atcaaggaaa acatctggat 660
 gttcaaaaac aattgaaaga acgacaaaaa atgttgcatt cgtatgatta a 711

<210> 56

<211> 236

<212> PRT

<213> Streptococcus agalactiae

<400> 56

Leu Leu Ala Lys Glu Thr Thr Met Ser Val Leu Trp Tyr Gln Asn Ser
 1 5 10 15
 Ala Glu Ala Lys Ala Leu Tyr Leu Gln Gly Tyr Asn Val Ala Lys Met
 20 25 30
 Lys Leu Asp Asp Trp Leu Gln Lys Pro Ser Glu Lys Pro Tyr Ser Ile
 35 40 45
 Ile Leu Asp Leu Asp Glu Thr Val Leu Asp Asn Ser Pro Tyr Gln Ala
 50 55 60
 Lys Asn Ile Lys Asp Gly Ser Ser Phe Thr Pro Glu Ser Trp Asp Lys
 65 70 75 80
 Trp Val Gln Lys Lys Ser Ala Lys Ala Val Ala Gly Ala Lys Glu Phe
 85 90 95
 Leu Lys Tyr Ala Asn Glu Lys Gly Ile Lys Ile Tyr Tyr Val Ser Asp
 100 105 110
 Arg Thr Asp Ala Gln Val Asp Ala Thr Lys Glu Asn Leu Glu Lys Glu
 115 120 125
 Gly Ile Pro Val Gln Gly Lys Asp His Leu Leu Phe Leu Lys Lys Gly
 130 135 140
 Met Lys Ser Lys Glu Ser Arg Arg Gln Ala Val Gln Lys Asp Thr Asn
 145 150 155 160
 Leu Ile Met Leu Phe Gly Asp Asn Leu Val Asp Phe Ala Asp Phe Ser
 165 170 175
 Lys Ser Ser Ser Thr Asp Arg Glu Gln Leu Leu Thr Lys Leu Gln Ser
 180 185 190
 Glu Phe Gly Ser Lys Phe Ile Val Phe Pro Asn Pro Met Tyr Gly Ser
 195 200 205
 Trp Glu Ser Ala Ile Tyr Gln Gly Lys His Leu Asp Val Gln Lys Gln
 210 215 220

Leu Lys Glu Arg Gln Lys Met Leu His Ser Tyr Asp

225

230

235

<210> 57

<211> 128

<212> DNA

<213> Streptococcus agalactiae

<400> 57

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 ggtgcacaaa tggctttctc aattgggtgct agtttgattg cctttgttgg tttagtttct 120
 ttgattaa 128

<210> 58

<211> 42

<212> PRT

<213> Streptococcus agalactiae

<400> 58

Met Asp Asn Lys Gly Asn Asn Ala Asn Val Ile Asp Ala Ile Ala Glu

1

5

10

15

Gly Ala Ser Thr Gly Ala Gln Met Ala Phe Ser Ile Gly Ala Ser Leu
 20 25 30

Ile Ala Phe Val Gly Leu Val Ser Leu Ile
 35 40

<210> 59

<211> 573

<212> DNA

<213> Streptococcus agalactiae

<400> 59

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 cttgtcattc attttttgtc atcatttatt tttagttttt ggtagtccc tattaaacct 120
 actttgatgc atatcccagt tattattgca tctatagcct atggacctcg tattggtgca 180
 actctaggcg ccttaatggg ggggatcagc gtagctaaca gcagcattgt tctattacca 240
 acgagttacc tcttctcacc ttttgttgaa aatggtaatt tttattcgct aattattgca 300
 cttgtaccac gtatttcta atcggtattt ccttatttcg tttacaaatt actacacaac 360
 cgctttgggt tggtatctc aggtgctata ggctctctaa caaacacagt atttgtttta 420
 tctggaattt ttatcttttt ttcaagtact tataatggga atatcaagct aatgctcgct 480
 gggattatth catctaattc attagctgag atggtcattg cagctatcat tgtatatcta 540
 actgatactc gtattctcaa tattaaacat taa 573

<210> 60

<211> 190

<212> PRT

<213> Streptococcus agalactiae

<400> 60

Met Lys Lys Lys Asn Lys Ser Ser Asn Ile Ala Ile Ile Ala Ile Phe
 1 5 10 15

Phe Ala Ile Met Leu Val Ile His Phe Leu Ser Ser Phe Ile Phe Ser
 20 25 30

Phe Trp Leu Val Pro Ile Lys Pro Thr Leu Met His Ile Pro Val Ile
 35 40 45

Ile Ala Ser Ile Ala Tyr Gly Pro Arg Ile Gly Ala Thr Leu Gly Ala
 50 55 60

Leu Met Gly Gly Ile Ser Val Ala Asn Ser Ser Ile Val Leu Leu Pro
 65 70 75 80

Thr Ser Tyr Leu Phe Ser Pro Phe Val Glu Asn Gly Asn Phe Tyr Ser
 85 90 95

Leu Ile Ile Ala Leu Val Pro Arg Ile Leu Ile Gly Ile Ile Pro Tyr
 100 105 110

Phe Val Tyr Lys Leu Leu His Asn Arg Phe Gly Leu Ala Ile Ser Gly
 115 120 125

Ala Ile Gly Ser Leu Thr Asn Thr Val Phe Val Leu Ser Gly Ile Phe
 130 135 140

Ile Phe Phe Ser Ser Thr Tyr Asn Gly Asn Ile Lys Leu Met Leu Ala
 145 150 155 160

Gly Ile Ile Ser Ser Asn Ser Leu Ala Glu Met Val Ile Ala Ala Ile
 165 170 175

Ile Val Tyr Leu Thr Asp Pro Arg Ile Leu Asn Ile Lys His
 180 185 190

<210> 61

<211> 251

<212> DNA

<213> Streptococcus agalactiae

<400> 61

ttgaatatga cattacaaga cgaaatcaaa aaacgccgta cttttgccat catctctcac 60

ccggatgctg gtaagacgac tattactgag caattattat attttggtgg tgaaattaga 120
 gaagcagggga cagtaaaagg gaaaaaatca ggtacttttg caaagtccga ctggatggat 180
 attgaaaagc aacggggtat ctctgttact tcactgttta tgcaatttga ttacgcgggt 240
 aaacgtgtta a 251

<210> 62

<211> 83

<212> PRT

<213> Streptococcus agalactiae

<400> 62

Met Asn Met Thr Leu Gln Asp Glu Ile Lys Lys Arg Arg Thr Phe Ala

1 5 10 15

Ile Ile Ser His Pro Asp Ala Gly Lys Thr Thr Ile Thr Glu Gln Leu

20 25 30

Leu Tyr Phe Gly Gly Glu Ile Arg Glu Ala Gly Thr Val Lys Gly Lys

35 40 45

Lys Ser Gly Thr Phe Ala Lys Ser Asp Trp Met Asp Ile Glu Lys Gln

50 55 60

Arg Gly Ile Ser Val Thr Ser Ser Val Met Gln Phe Asp Tyr Ala Gly

65 70 75 80

Lys Arg Val

<210> 63

<211> 303

<212> DNA

<213> Streptococcus agalactiae

<400> 63

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 aaaattgaaa agcctgctct ttcgtttatg caagatgcgt ggcgtcgctt gaaaaaaaaac 120

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aaattagcag tagtttcaact ctatttatta gctcttttac ttactttttc gttagcctca 180
aatttatttg taactcagaa ggatgctaata gggtttgatt cgaaaaaagt aacgacatat 240
cgcaacttac cacctaaatt gagttcaaac ctcccttttt ggaatggtag cattaatcca 300
tca 303

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<210> 64

<211> 101

<212> PRT

<213> Streptococcus agalactiae

<400> 64

Met Ala Asp Lys Asn Arg Thr Phe Lys Leu Val Gly Ala Gly Ser Ser
1 5 10 15

Ser Thr Gln Glu Lys Ile Glu Lys Pro Ala Leu Ser Phe Met Gln Asp
20 25 30

Ala Trp Arg Arg Leu Lys Lys Asn Lys Leu Ala Val Val Ser Leu Tyr
35 40 45

Leu Leu Ala Leu Leu Leu Thr Phe Ser Leu Ala Ser Asn Leu Phe Val
50 55 60

Thr Gln Lys Asp Ala Asn Gly Phe Asp Ser Lys Lys Val Thr Thr Tyr
65 70 75 80

Arg Asn Leu Pro Pro Lys Leu Ser Ser Asn Leu Pro Phe Trp Asn Gly
85 90 95

Ser Ile Asn Pro Ser
100

Age Group	1970 (%)	1980 (%)	1990 (%)
15-24	~15.0	~25.0	~35.0
25-34	~15.0	~15.0	~15.0
35-44	~15.0	~15.0	~15.0
45-54	~15.0	~15.0	~15.0
55-64	~15.0	~15.0	~15.0
65-74	~15.0	~15.0	~15.0
75+	~15.0	~15.0	~15.0

<210> 65

<211> 154

<212> DNA

<213> Streptococcus agalactiae

<400> 65

atgaaaagaa aacagtttat aaaattagga attgcaacct tactaacggt tatttcgctt 60
 tacacaccaa taaacctagc tacaaatcat accacagaaa atattgttac tgctcaagag 120
 tataaaacaa agagaatggt actttacctt ttaa 154

<210> 66

<211> 51

<212> PRT

<213> Streptococcus agalactiae

<400> 66

Met Lys Arg Lys Gln Phe Ile Lys Leu Gly Ile Ala Thr Leu Leu Thr
 1 5 10 15

Val Ile Ser Leu Tyr Thr Pro Ile Asn Leu Ala Thr Asn His Thr Thr
 20 25 30

Glu Asn Ile Val Thr Ala Gln Glu Tyr Lys Thr Lys Glu Asn Ile Leu
 35 40 45

Phe Leu Leu
 50

<210> 67

<211> 144

<212> DNA

<213> Streptococcus agalactiae

<400> 67

atgttttata atcctttact ttttattgta ctaattacaa ttgctgtatt tttottagct 60

aagaaaaaat ggcaattacc gacatttact ttcattgggt tgcattttat ctataaccaa 120
 gggctgtggg aacagttgat taat 144

<210> 68

<211> 48

<212> PRT

<213> Streptococcus agalactiae

<400> 68

Met Phe Tyr Asn Pro Leu Leu Phe Ile Val Leu Ile Thr Ile Ala Val

1 5 10 15

Phe Phe Leu Ala Lys Lys Lys Trp Gln Leu Pro Thr Phe Thr Phe Ile

20 25 30

Gly Leu Leu Phe Ile Tyr Asn Gln Gly Leu Trp Glu Gln Leu Ile Asn

35 40 45

<210> 69

<211> 453

<212> DNA

<213> Streptococcus agalactiae

<400> 69

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 atactaggag gctgtcaaat gaatagtga cataaaagtc agtataatga aacaaaaagt 120
 agcaagcaat cagaagtga gaaagataaa aaaatgacaa aaaaagaaca attagcttat 180
 ctcaaagagc atgaacaaga aataattgat tttgtaaaa ctcagaataa aaagatagaa 240
 tctgtacaaa ttgattggaa tgatgttcga tggagtaaag ggggaaatgg tacacctcaa 300
 ggaggaggag aggggatttt actttttggg gagattaata atgattctga atcaagttgg 360
 agagttgata ttgatataga aaaaggacgg ctagacctaa aaaatatgta tttaggacaa 420
 cctatacgaa ttggaggtaa attatttgag taa 453

<210> 70

<211> 150

<212> PRT

<213> Streptococcus agalactiae

<400> 70

Met Val Gln Ile Met Lys Lys His Ile Lys Ser Ile Ile Pro Ile Val

1

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10

15

Leu Ile Gly Met Ile Leu Gly Gly Cys Gln Met Asn Ser Glu His Lys

20

25

30

Ser Gln Tyr Asn Glu Thr Lys Ser Ser Lys Gln Ser Glu Val Lys Lys

35

40

45

Asp Lys Lys Met Thr Lys Lys Glu Gln Leu Ala Tyr Leu Lys Glu His

50

55

60

Glu Gln Glu Ile Ile Asp Phe Val Lys Ser Gln Asn Lys Lys Ile Glu

65

70

75

80

Ser Val Gln Ile Asp Trp Asn Asp Val Arg Trp Ser Lys Gly Gly Asn

85

90

95

Gly Thr Pro Gln Gly Gly Gly Glu Gly Ile Leu Leu Phe Gly Glu Ile

100

105

110

Asn Asn Asp Ser Glu Ser Ser Trp Arg Val Asp Ile Asp Ile Glu Lys

115

120

125

Gly Arg Leu Asp Leu Lys Asn Met Tyr Leu Gly Gln Pro Ile Arg Ile

130

135

140

Gly Gly Lys Leu Phe Glu

145

150

<210> 71

<211> 1455

<212> DNA

<213> Streptococcus agalactiae

<400> 71

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<210> 72

<211> 485

<212> PRT

<213> Streptococcus agalactiae

<400> 72

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Pro His Gly Asn His Phe His Phe Ile His Tyr Lys Asp Met Ser Pro
 20 25 30

Leu Glu Leu Glu Ala Thr Arg Met Val Ala Glu His Arg Gly His His
 35 40 45

Ile Asp Ala Leu Gly Lys Lys Asp Ser Thr Glu Lys Pro Lys His Ile
 50 55 60

Ser His Glu Pro Asn Lys Glu Pro His Thr Glu Glu Glu His His Ala
 65 70 75 80

Val Thr Pro Lys Asp Gln Arg Lys Gly Lys Pro Asn Ser Gln Ile Val
 85 90 95

Tyr Ser Ala Gln Glu Ile Glu Glu Ala Lys Lys Ala Gly Lys Tyr Thr
 100 105 110

Thr Ser Asp Gly Tyr Ile Phe Asp Ala Lys Asp Ile Lys Lys Asp Thr
 115 120 125

Gly Thr Gly Tyr Val Ile Pro His Met Thr His Glu His Trp Val Pro
 130 135 140

Lys Lys Asp Leu Ser Glu Ser Glu Leu Lys Ala Ala Gln Glu Phe Leu
 145 150 155 160

Ser Gly Lys Ser Glu Ala Asn Gln Asp Lys Pro Lys Thr Gly Lys Thr
 165 170 175

Ala Gln Glu Ile Tyr Glu Ala Ile Glu Pro Lys Ala Ile Val Lys Pro
 180 185 190

Glu	Asp	Leu	Leu	Phe	Gly	Ile	Ala	Gln	Ala	Thr	Asp	Tyr	Lys	Asn	Gly	
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Thr	Phe	Val	Ile	Pro	His	Lys	Asp	His	Tyr	His	Tyr	Val	Glu	Leu	Lys	
		210				215					220					
Trp	Phe	Asp	Glu	Glu	Lys	Asp	Leu	Leu	Ala	Asp	Ser	Asp	Lys	Thr	Tyr	
		225			230					235						240
Ser	Leu	Glu	Asp	Tyr	Leu	Ala	Thr	Ala	Lys	Tyr	Tyr	Met	Met	His	Pro	
			245						250					255		
Glu	Lys	Arg	Pro	Lys	Val	Glu	Gly	Trp	Gly	Lys	Asp	Ala	Glu	Ile	Tyr	
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Lys	Glu	Lys	Asp	Ser	Asn	Lys	Ala	Asp	Lys	Pro	Ser	Pro	Ala	Pro	Thr	
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Asp	Asn	Lys	Ser	Thr	Ser	Asn	Ser	Ser	Asp	Lys	Asn	Leu	Ser	Ala	Ala	
		290				295					300					
Glu	Val	Phe	Lys	Gln	Ala	Lys	Pro	Glu	Lys	Ile	Val	Pro	Leu	Asp	Lys	
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Ile	Ala	Ala	His	Met	Ala	Tyr	Ala	Val	Gly	Phe	Glu	Asp	Asp	Gln	Leu	
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Asp	Lys	Gly	Gly	Leu	Trp	Lys	Ala	Pro	Glu	Gly	Tyr	Thr	Leu	Gln	Gln	
		355					360					365				
Leu	Phe	Ser	Thr	Ile	Lys	Tyr	Tyr	Met	Glu	His	Pro	Asn	Glu	Leu	Pro	
		370				375					380					
Lys	Glu	Lys	Gly	Trp	Gly	His	Asp	Ser	Asp	His	Asn	Lys	Gly	Ser	Asn	
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Lys Asp Asn Lys Ala Lys Asn Tyr Ala Pro Asp Glu Glu Pro Glu Asp
 405 410 415

Ser Gly Lys Val Thr His Asn Tyr Gly Phe Tyr Asp Val Asn Lys Gly
 420 425 430

Ser Asp Glu Glu Glu Pro Glu Lys Gln Glu Asp Glu Ser Glu Leu Asp
 435 440 445

Glu Tyr Glu Leu Gly Met Ala Gln Asn Ala Lys Lys Tyr Gly Met Asp
 450 455 460

Arg Gln Ser Phe Glu Lys Gln Leu Ile Gln Leu Ser Asn Lys Tyr Ser
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Val Ser Phe Glu Ser
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<210> 73

<211> 855

<212> DNA

<213> Streptococcus agalactiae

<400> 73

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<210> 74
<211> 284
<212> PRT
<213> Streptococcus agalactiae
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Met Arg Lys Arg Phe Ser Leu Leu Asn Phe Ile Val Val Thr Phe Ile
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Phe Phe Phe Phe Ile Leu Phe Pro Leu Phe Lys Ala Lys Asp Cys Gln
20 25 30

Val Val Tyr Ala Ser Phe Gln Gly Asp His Trp Asp Ile Cys Asn Ala
35 40 45

Phe Asp Phe Pro Tyr Leu His Arg Phe Asp Leu Ile Lys Gly Lys Glu
50 55 60

Asn Gln Leu Tyr Phe Ile Gly Cys Thr Ile Ala Asn Ser Lys Ala Tyr
65 70 75 80

Thr Glu Asp Trp Ser Asp Lys Gly Arg Ile Phe Val Ala Arg Phe Asn
85 90 95

Thr Gln Asn His Thr Leu Glu Gly Leu Gln Gln Leu Pro Gln Thr Leu
100 105 110

Leu Lys Asn His Gly Tyr Tyr Ala Ile Gln Asp Glu Gly Tyr Ser Leu
115 120 125

Ile Thr Ser Val Glu Gly Val Leu Lys Leu Thr Tyr Pro Glu Phe Ser
130 135 140

Thr Thr Gly Asp Trp Gln Leu Glu Arg Leu Phe Asp Glu Glu Thr Ser
145 150 155 160

Asp Val Val Lys Val Asp Ile Asn Gln Asp Gly Lys Asp Glu Tyr Val
165 170 175

Ile Ile Gln Gly Phe His Gly Asp Arg Leu Arg Ile Phe Thr Glu Asp
180 185 190

Phe Gly Arg Glu Leu Phe His Tyr Pro Glu Lys Thr Pro Phe Gly His
195 200 205

Ala Ile Trp Ser Gly Arg Leu Leu Asn Gln Thr Cys Phe Val Phe Gly
210 215 220

Trp Arg Ser Glu Lys Ala Glu Leu Arg Leu Phe His Phe Val Asp Gly
225 230 235 240

His Leu Val Ser Glu Leu Val Asp Ala Lys Ala Ala Ser Ser Asn Val
245 250 255

Leu Ala Phe Glu Lys Asp Gly Lys Ala Tyr Leu Phe Ser Ala Asn Asn
260 265 270

Gly Arg Gly Glu Val Ala Leu Tyr Gln Leu Val Lys
275 280

<210> 75

<211> 2070

<212> DNA

<213> Streptococcus agalactiae

<400> 75

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<210> 76

<211> 689

<212> PRT

<213> Streptococcus agalactiae

<400> 76

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 20 25 30

Asp Thr Ala Tyr Ala Pro Phe Glu Phe Lys Asp Ser Asp Gln Thr Tyr
 35 40 45

Lys Gly Ile Asp Val Asp Ile Val Asn Glu Val Ala Lys Arg Ala Gly
 50 55 60

Trp Asn Val Asn Met Thr Tyr Pro Gly Phe Asp Ala Ala Val Asn Ala
 65 70 75 80

Val Gln Ser Gly Gln Ala Asp Ala Leu Met Ala Gly Thr Thr Val Thr
 85 90 95

Glu Ala Arg Lys Lys Val Phe Asn Phe Ser Asp Thr Tyr Tyr Asp Thr
 100 105 110

Ser Val Ile Leu Tyr Thr Lys Asn Asn Asn Lys Val Thr Asn Tyr Lys
 115 120 125

Gln Leu Lys Gly Lys Val Val Gly Val Lys Asn Gly Thr Ala Ala Gln
 130 135 140

Ser Phe Leu Glu Glu Asn Lys Ser Lys Tyr Gly Tyr Lys Val Lys Thr
 145 150 155 160

Phe Asp Thr Ser Asp Leu Met Asn Asn Ser Leu Asp Ser Gly Ser Ile
 165 170 175

Tyr Ala Ala Met Asp Asp Gln Pro Val Val Gln Phe Ala Ile Asn Gln
 180 185 190

Gly	Lys	Ala	Tyr	Ala	Ile	Asn	Met	Glu	Gly	Glu	Ala	Val	Gly	Ser	Phe	
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	210					215					220					
Phe	Asn	Thr	Ala	Phe	Ala	Gln	Met	Lys	Ser	Asp	Gly	Thr	Tyr	Asn	Asp	
225					230					235					240	
Ile	Met	Asp	Lys	Trp	Leu	Gly	Lys	Asp	Ala	Thr	Lys	Thr	Ser	Gly	Lys	
			245						250					255		
Ala	Thr	Gly	Asn	Ala	Asn	Glu	Lys	Ala	Thr	Pro	Val	Lys	Pro	Ser	Tyr	
		260						265					270			
Lys	Ile	Val	Ser	Asp	Ser	Ser	Phe	Ala	Pro	Phe	Glu	Tyr	Gln	Asn	Gly	
	275						280					285				
Lys	Gly	Lys	Tyr	Thr	Gly	Phe	Asp	Met	Glu	Leu	Ile	Thr	Lys	Ile	Ala	
	290					295					300					
Lys	Gln	Gln	Gly	Phe	Lys	Leu	Asp	Ile	Ser	Asn	Pro	Gly	Phe	Asp	Ala	
305					310					315					320	
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			325						330					335		
Ala	Thr	Ile	Thr	Glu	Ala	Arg	Gln	Lys	Ile	Phe	Asp	Phe	Ser	Asp	Pro	
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Tyr	Tyr	Thr	Ser	Ser	Val	Ile	Leu	Ala	Val	Lys	Lys	Gly	Ser	Asn	Val	
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Lys	Ser	Tyr	Gln	Asp	Leu	Lys	Gly	Lys	Thr	Val	Gly	Ala	Lys	Asn	Gly	
	370					375					380					
Thr	Ala	Ser	Tyr	Thr	Trp	Leu	Ser	Asp	His	Ala	Asp	Lys	Tyr	Asn	Tyr	
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His Val Lys Ala Phe Asp Glu Ala Ser Thr Met Tyr Asp Ser Met Asn
 405 410 415

Ser Gly Ser Ile Asp Ala Leu Met Asp Asp Glu Ala Val Leu Ala Tyr
 420 425 430

Ala Ile Asn Gln Gly Arg Lys Phe Glu Thr Pro Ile Lys Gly Glu Lys
 435 440 445

Ser Gly Asp Ile Gly Phe Ala Val Lys Lys Gly Ala Asn Pro Glu Leu
 450 455 460

Ile Lys Met Phe Asn Asn Gly Leu Ala Ser Leu Lys Lys Ser Gly Glu
 465 470 475 480

Tyr Asp Lys Leu Val Lys Lys Tyr Leu Ser Thr Ala Ser Thr Ser Ser
 485 490 495

Asn Asp Lys Ala Ala Lys Pro Val Asp Glu Ser Thr Ile Leu Gly Leu
 500 505 510

Ile Ser Asn Asn Tyr Lys Gln Leu Leu Ser Gly Ile Gly Thr Thr Leu
 515 520 525

Ser Leu Thr Leu Ile Ser Phe Ala Ile Ala Met Val Ile Gly Ile Ile
 530 535 540

Phe Gly Met Met Ser Val Ser Pro Ser Asn Thr Leu Arg Thr Ile Ser
 545 550 555 560

Met Ile Phe Val Asp Ile Val Arg Gly Ile Pro Leu Met Ile Val Ala
 565 570 575

Ala Phe Ile Phe Trp Gly Ile Pro Asn Leu Ile Glu Ser Ile Thr Gly
 580 585 590

His Gln Ser Pro Ile Asn Asp Phe Val Ala Ala Thr Ile Ala Leu Ser
 595 600 605

105210-TH-5260

Ser

Met Glu Gly Leu Leu Ile Ala Leu Ile Pro Met Phe Ala Trp Gly Ser
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Phe Gly Met Thr Leu Gly Ala Leu Leu Phe Ala Ile Ile Val Cys Leu
35 40 45

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<210> 79
<211> 963
<212> DNA
<213> Streptococcus agalactiae
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<400> 79						
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<210> 80

<211> 320

<212> PRT

<213> Streptococcus agalactiae

<400> 80

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1

5

10

15

Tyr Glu Gly Tyr Leu Tyr Glu Ile Thr Gly Glu Glu Cys Glu Glu Ala

20

25

30

Leu Asp Leu Val Ile Pro Lys Asn Ile Val Phe Ala Asp Thr Asp Thr

35

40

45

Cys Gly Tyr Thr Phe Leu Leu Asn Glu Asp Gly Thr Val Tyr Asp Asp

50

55

60

Val Thr Phe Tyr Lys Phe Asp Asp Lys Tyr Trp Leu Ala Ser His Lys

65

70

75

80

Ala Leu Asp Ser Tyr Leu Asp Asn Ile Asn Phe Asp Tyr Thr Val Thr

85

90

95

Asp Ile Ser Asp Glu Tyr Lys Met Leu Gln Ile Glu Gly Arg Tyr Ser

100

105

110

Gly Glu Ile Ala Gln Ser Phe Tyr Glu Tyr Asp Ile Ser Thr Leu Asn

115

120

125

Phe Arg Thr Leu Arg Ile Glu Met Asp Phe Ile Lys Gly Glu Glu Arg

130

135

140

Leu Ser Trp Arg Arg Phe Gly Phe Ser Gly Glu Phe Gly Tyr Gln Phe

145

150

155

160

Phe Leu Pro Ser Ser Ile Phe Ala Thr Phe Val Ser Asp Val Cys Glu

165

170

175

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<210> 82

<211> 233

<212> PRT

<213> Streptococcus agalactiae

<400> 82

Met Glu Leu Val Ile Arg Asp Ile Arg Lys Arg Phe Gln Glu Thr Glu
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Val Leu Arg Gly Ala Ser Tyr Arg Phe Tyr Ser Gly Lys Ile Thr Gly
 20 25 30

Val Leu Gly Arg Asn Gly Ala Gly Lys Thr Thr Leu Phe Asn Ile Leu
 35 40 45

Tyr Gly Asp Leu Ala Ala Asp Asn Gly Thr Ile Cys Leu Leu Lys Asp
 50 55 60

Asn His Glu Tyr Pro Leu Thr Asp Lys Asp Ile Gly Ile Val Tyr Ser
 65 70 75 80

Glu Asn Tyr Leu Pro Glu Phe Leu Thr Gly Tyr Glu Phe Val Lys Phe
 85 90 95

Tyr Met Asp Leu His Pro Ser Asp Asp Leu Met Thr Ile Asp Asp Tyr
 100 105 110

Leu Asp Phe Met Glu Ile Gly Gln Thr Glu Arg His Arg Ile Ile Lys
 115 120 125

Gly Tyr Ser Asp Gly Met Lys Ser Lys Leu Ser Leu Ile Cys Leu Met
 130 135 140

Ile Ser Lys Pro Lys Val Ile Leu Leu Asp Glu Pro Leu Thr Ala Val
 145 150 155 160

Asp Val Val Ser Ser Ile Ala Ile Lys Arg Leu Leu Leu Glu Leu Ser
 165 170 175

Glu Asp His Ile Ile Ile Leu Ser Thr His Ile Met Ala Leu Ala Glu
 180 185 190

Asp Leu Cys Asp Ile Val Ala Val Leu Asp Lys Gly Lys Leu Gln Thr
 195 200 205

Leu Asp Ile Asp Arg Lys His Glu Gln Phe Glu Glu Arg Leu Leu Gln
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Val Leu Lys Gly Asp Glu Tyr Asp Lys
 225 230

<210> 83

<211> 774

<212> DNA

<213> Streptococcus agalactiae

<400> 83

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 ggtgtggata aaaaatccgc ttatattggt ggttctgggt tagcaggatt agctgccgct 120
 gtcttttttaa tacgtgacgg tcaaattgat ggtcaacgta ttcataatddd tgaagaacta 180
 cctctttctg gaggatcact tgacggtgtc aaacgacctg atatcggttt tgtaacgcgt 240
 ggtggctgtg aaatggaaaa tcacttcgaa tgtatgtggg atatgtaccg ttccatcccc 300
 tctctcgaag ttccagatgc ttcttatcta gatgaatddd attggcttga caaggatgat 360

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cccaattcat ctaactgtcg cctcattcat aaacagggga atcgcttaga atctgatggt 420
gatttttacac tcggaacaca ttccaaagag ttagttaagc tagtcatgga gactgaagag 480
tcttttaggtg ctaagacgat tgaagaagtt ttttcaaaag aattttttga aagtaatttt 540
tggacttatt gggctactat gtttgccttt gagaaatggc attcagcgat tgaaatgcgt 600
cgatatgcta tgcgctttat ccatcatatt ggtggtctgc ctgatttcac ttcattaaaa 660
tttaataaat ataatcaata tgattctatg gtgaaaccaa tcatcagtta tttagagtct 720
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<210> 84

<211> 258

<212> PRT

<213> Streptococcus agalactiae

<400> 84

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Met Phe Met Arg Tyr Thr Asn Gly Asn Phe Glu Ala Phe Ala Arg Pro
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Arg Lys Pro Glu Gly Val Asp Lys Lys Ser Ala Tyr Ile Val Gly Ser
      20             25             30

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Gly Leu Ala Gly Leu Ala Ala Ala Val Phe Leu Ile Arg Asp Gly Gln
      35             40             45

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Met Asp Gly Gln Arg Ile His Ile Phe Glu Glu Leu Pro Leu Ser Gly
      50             55             60

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Gly Ser Leu Asp Gly Val Lys Arg Pro Asp Ile Gly Phe Val Thr Arg
      65             70             75             80

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Gly Gly Arg Glu Met Glu Asn His Phe Glu Cys Met Trp Asp Met Tyr
      85             90             95

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Arg Ser Ile Pro Ser Leu Glu Val Pro Asp Ala Ser Tyr Leu Asp Glu
      100            105            110

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Phe Tyr Trp Leu Asp Lys Asp Asp Pro Asn Ser Ser Asn Cys Arg Leu
      115            120            125

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Ile His Lys Gln Gly Asn Arg Leu Glu Ser Asp Gly Asp Phe Thr Leu
 130 135 140

Gly Thr His Ser Lys Glu Leu Val Lys Leu Val Met Glu Thr Glu Glu
 145 150 155 160

Ser Leu Gly Ala Lys Thr Ile Glu Glu Val Phe Ser Lys Glu Phe Phe
 165 170 175

Glu Ser Asn Phe Trp Thr Tyr Trp Ala Thr Met Phe Ala Phe Glu Lys
 180 185 190

Trp His Ser Ala Ile Glu Met Arg Arg Tyr Ala Met Arg Phe Ile His
 195 200 205

His Ile Gly Gly Leu Pro Asp Phe Thr Ser Leu Lys Phe Asn Lys Tyr
 210 215 220

Asn Gln Tyr Asp Ser Met Val Lys Pro Ile Ile Ser Tyr Leu Glu Ser
 225 230 235 240

His Asn Val Asp Val Gln Phe Asp Ser Lys Val Thr Asn Ile Ser Val
 245 250 255

Asp Phe

<210> 85

<211> 903

<212> DNA

<213> Streptococcus agalactiae

<400> 85

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 atgaaaaaat tacttagatg gcttcctcct gtacttttca ttattatcct tataggaatg 120
 actatcttag gtaagtccta tatcaataaa gtaacagctc acaaaataaa actctataac 180

tctcgaatga ctctactat ttttaatttca ggatccagtg ctactcaaga acgatttaac 240
 agcatgttag cacagctcaa ccaaattgga gaaaaacata gcgtttttaa gttaactgtc 300
 aaaaaagaca atagcattat ctacaatgga caaattagcg gcaatgacca caaacctac 360
 attgtcattg gatttgaaaa taatgaagat gggttatagta acatcaaaaa acaaacaaaa 420
 tggctacaga ttgctatgaa tgatcttcag aagaaatata aatttaaagc ttttaacgct 480
 atcggtcatt caaatgggtg cttatcatgg actattttcc tagaagatta ttacgactct 540
 gatgaatttg atatgaaatc attgttaaca atgggaacac cttttaactt tgaagaaagt 600
 aacacctcaa atcataactca aatgcttaaa gatttaaatca gtaataaagg aaatattcca 660
 tcaagtctca tgggtatacaa tttggcagga actaatcat atgatggtga taaaattggt 720
 ccatttgcta gtgtggagac tggtaaatat attttccaag aaaccgctaa acactatacc 780
 caactaacag taactggtaa taatgctaca cattctgact tgcttgataa tcctgaagtt 840
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 taa 903

<210> 86

<211> 300

<212> PRT

<213> Streptococcus agalactiae

<400> 86

Met Leu Ala Ser Leu Phe Ile Val Arg Leu Ser Lys Ser Leu Ser Leu

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Arg Arg Ser Asn Met Lys Lys Leu Leu Arg Trp Leu Pro Pro Val Leu

20 25 30

Phe Ile Ile Ile Leu Ile Gly Met Thr Ile Leu Gly Lys Ser Tyr Ile

35 40 45

Asn Lys Val Thr Ala His Lys Ile Lys Leu Tyr Asn Ser Arg Met Thr

50 55 60

Pro Thr Ile Leu Ile Ser Gly Ser Ser Ala Thr Gln Glu Arg Phe Asn

65 70 75 80

Ser Met Leu Ala Gln Leu Asn Gln Met Gly Glu Lys His Ser Val Leu

85 90 95

Lys Leu Thr Val Lys Lys Asp Asn Ser Ile Ile Tyr Asn Gly Gln Ile
 100 105 110

Ser Gly Asn Asp His Lys Pro Tyr Ile Val Ile Gly Phe Glu Asn Asn
 115 120 125

Glu Asp Gly Tyr Ser Asn Ile Lys Lys Gln Thr Lys Trp Leu Gln Ile
 130 135 140

Ala Met Asn Asp Leu Gln Lys Lys Tyr Lys Phe Lys Arg Phe Asn Ala
 145 150 155 160

Ile Gly His Ser Asn Gly Gly Leu Ser Trp Thr Ile Phe Leu Glu Asp
 165 170 175

Tyr Tyr Asp Ser Asp Glu Phe Asp Met Lys Ser Leu Leu Thr Met Gly
 180 185 190

Thr Pro Phe Asn Phe Glu Glu Ser Asn Thr Ser Asn His Thr Gln Met
 195 200 205

Leu Lys Asp Leu Ile Ser Asn Lys Gly Asn Ile Pro Ser Ser Leu Met
 210 215 220

Val Tyr Asn Leu Ala Gly Thr Asn Ser Tyr Asp Gly Asp Lys Ile Val
 225 230 235 240

Pro Phe Ala Ser Val Glu Thr Gly Lys Tyr Ile Phe Gln Glu Thr Ala
 245 250 255

Lys His Tyr Thr Gln Leu Thr Val Thr Gly Asn Asn Ala Thr His Ser
 260 265 270

Asp Leu Pro Asp Asn Pro Glu Val Ile Gln Tyr Val Ala Glu Lys Ile
 275 280 285

Leu Lys Asn Glu Lys Gly Lys Leu Pro Lys Pro His
 290 295 300

100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300

<210> 87

<211> 912

<212> DNA

<213> Streptococcus agalactiae

<400> 87

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tattcacatc ctgagaggat tcgccaatta gttgctgaga ttgaactagc tgatcaagtt 120
ggtttagatg tatatggtat tggagagcac catcgtgaag attttgcggt ctctgcaccc 180
gaaattatcc tagcagcagg agcggttaga actaataata tccgtttata tagtgcagta 240
acgattctct cttccaatga tcctattcgc gtctatcagc aattttcaac gattgacgca 300
ctttcaaagt gtagagcaga aattatggca gggcgtggtt cttttattga gtcttttcca 360
ttgtttggat acgatttagc ggattatgat gatttattta atgaaaaaat ggatatgttg 420
ttagcaatta actcagcgac aaatctcgat tggaaaggtc atttgacaca aacagttaat 480
gagcgaccaa tttatccaag agcattacaa agacagttat caatatgggt ggcaacagga 540
ggaaatgttg attctacaat tcgtattgca gaacaagggt tgccaattgt ttatgcaact 600
attggtggga atcccaaagc ctttcgtcaa ttggtccata tttataaaga agttggtaag 660
tccgtaatgg acacaaacca ggaacaacta aaagttgctg ctactcttg gggatggatt 720
gaagaggata atcaaaccgc tattgaccgt tattttttcc ctacgaaaca gaccgtcgat 780
aatattgcta agggacgccc tcattggtct gaaatgacta aagagcagta tttacgttca 840
ataggtccag aaggtgctat ttttgtagga aatcctgaag tggttgcaca taaaattata 900
ggactttggt ga 912

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<210> 88

<211> 303

<212> PRT

<213> Streptococcus agalactiae

<400> 88

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Met Lys Leu Gly Ile Thr Thr Phe Gly Glu Thr Thr Ile Leu Glu Glu
  1             5             10             15

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Thr Asn Gln Ser Tyr Ser His Pro Glu Arg Ile Arg Gln Leu Val Ala
      20             25             30

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Glu Ile Glu Leu Ala Asp Gln Val Gly Leu Asp Val Tyr Gly Ile Gly
 35 40 45

Glu His His Arg Glu Asp Phe Ala Val Ser Ala Pro Glu Ile Ile Leu
 50 55 60

Ala Ala Gly Ala Val Arg Thr Asn Asn Ile Arg Leu Ser Ser Ala Val
 65 70 75 80

Thr Ile Leu Ser Ser Asn Asp Pro Ile Arg Val Tyr Gln Gln Phe Ser
 85 90 95

Thr Ile Asp Ala Leu Ser Asn Gly Arg Ala Glu Ile Met Ala Gly Arg
 100 105 110

Gly Ser Phe Ile Glu Ser Phe Pro Leu Phe Gly Tyr Asp Leu Ala Asp
 115 120 125

Tyr Asp Asp Leu Phe Asn Glu Lys Met Asp Met Leu Leu Ala Ile Asn
 130 135 140

Ser Ala Thr Asn Leu Asp Trp Lys Gly His Leu Thr Gln Thr Val Asn
 145 150 155 160

Glu Arg Pro Ile Tyr Pro Arg Ala Leu Gln Arg Gln Leu Ser Ile Trp
 165 170 175

Val Ala Thr Gly Gly Asn Val Asp Ser Thr Ile Arg Ile Ala Glu Gln
 180 185 190

Gly Leu Pro Ile Val Tyr Ala Thr Ile Gly Gly Asn Pro Lys Ala Phe
 195 200 205

Arg Gln Leu Val His Ile Tyr Lys Glu Val Gly Lys Ser Val Met Asp
 210 215 220

Thr Asn Gln Glu Gln Leu Lys Val Ala Ala His Ser Trp Gly Trp Ile
 225 230 235 240

100

Glu Glu Asp Asn Gln Thr Ala Ile Asp Arg Tyr Phe Phe Pro Thr Lys
245 250 255

Gln Thr Val Asp Asn Ile Ala Lys Gly Arg Pro His Trp Ser Glu Met
260 265 270

Thr Lys Glu Gln Tyr Leu Arg Ser Ile Gly Pro Glu Gly Ala Ile Phe
275 280 285

Val Gly Asn Pro Glu Val Val Ala His Lys Ile Ile Gly Leu Trp
290 295 300

<210> 89

<211> 693

<212> DNA

<213> Streptococcus agalactiae

<400> 89

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ggagggttta tgggattggt aggagggttta ttccttggtt taactagtcc tagaggagtt 180
attgctaata aattagtatt tggaggttta gataaagttg tttctgtttt tagagctctg 240
cccttcatta ttcttcctgc tttgattgcg ccagtaactc gcgtaattgt aggaacaaca 300
cttggttcac cagcagcttt ggtacctctt tctttggcag tttccatt ttttgctcgt 360
caagttcaag ttgttttagc tgaacttgat ggtggagtta ttgaggctgc acaagcctca 420
ggtggaacac tttgggatat tattgtagtt tatcttcgtg aaggtctacc agatttaatt 480
cgagtatcaa cggttacttt gatttcctta gtaggtgaaa cagctatggc tggcgctatt 540
ggtgcaggag gattgggttc tggtgctatt actaaaggat ataactattc tcgtgatgat 600
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<210> 90

<211> 230

<212> PRT

<213> Streptococcus agalactiae

Ala Gly Ala Ile Gly Ala Gly Gly Leu Gly Ser Val Ala Ile Thr Lys
180 185 190

Gly Tyr Asn Tyr Ser Arg Asp Asp Ile Thr Leu Val Ala Thr Ile Leu
 195 200 205

Ile Leu Leu Leu Ile Phe Phe Ile Gln Phe Leu Gly Asp Phe Leu Thr
 210 215 220

Arg Arg Leu Ser His Lys
 225 230

<210> 91

<211> 759

<212> DNA

<213> Streptococcus agalactiae

<400> 91

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 aatattccat tgctccttct ttgctacttt ggcttaggta aacaaacctt tttaaaaact 120
 gtctatgggt cttggatttt tcctgttttt attaagttaa cacaaagtgt accaactttg 180
 acccacaact cactcctcgc agcacttttt ggaggtgtta ttgtaggatg tggtttgggg 240
 attgtttttt ggagcgactc ttcaactggg ggaacgggga ttatcattca attcttagga 300
 aaatatactc ctataagcct tggacaaggg gttatattga ttgatggact tgttacaatt 360
 gttgggtttcc tagcttttga cagtgatacg gttatgtttt ctattattgg gttgataact 420
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 acagaaattc ccgttaaagg gggatattct ggaactaatc aaatcatgct tatgacaact 600
 attgctgggt atgagtttgc taaattacaa gaggcaatag cagaaattga cgaaacagcc 660
 ttcataacag taactccaac atcacaagct tctggacgtg gatttagtct tcaaaaaaat 720
 catggacgtc ttgatgaaga cattcttatg ccaatgtaa 759

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<210> 92

<211> 252

<212> PRT

<213> Streptococcus agalactiae

<400> 92

Met Ala Val Ser Phe His Glu Val Phe Gly Trp Asp Ser Ala Phe Phe
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Ile Met Ile Ile Asn Ile Pro Leu Leu Leu Leu Cys Tyr Phe Gly Leu
 20 25 30

Gly Lys Gln Thr Phe Leu Lys Thr Val Tyr Gly Ser Trp Ile Phe Pro
 35 40 45

Val Phe Ile Lys Leu Thr Gln Ser Val Pro Thr Leu Thr His Asn Ser
 50 55 60

Leu Leu Ala Ala Leu Phe Gly Gly Val Ile Val Gly Cys Gly Leu Gly
 65 70 75 80

Ile Val Phe Trp Ser Asp Ser Ser Thr Gly Gly Thr Gly Ile Ile Ile
 85 90 95

Gln Phe Leu Gly Lys Tyr Thr Pro Ile Ser Leu Gly Gln Gly Val Ile
 100 105 110

Leu Ile Asp Gly Leu Val Thr Ile Val Gly Phe Leu Ala Phe Asp Ser
 115 120 125

Asp Thr Val Met Phe Ser Ile Ile Gly Leu Ile Thr Ile Ser Tyr Ile
 130 135 140

Ile Asn Ala Ile Gln Thr Gly Phe Thr Thr Leu Ser Thr Val Leu Ile
 145 150 155 160

Val Ser Gln Glu His Gln Lys Ile Lys Thr Tyr Ile Asn Thr Val Ala
 165 170 175

104

Asp Arg Gly Val Thr Glu Ile Pro Val Lys Gly Gly Tyr Ser Gly Thr
180 185 190

Asn Gln Ile Met Leu Met Thr Thr Ile Ala Gly Tyr Glu Phe Ala Lys
195 200 205

Leu Gln Glu Ala Ile Ala Glu Ile Asp Glu Thr Ala Phe Ile Thr Val
210 215 220

Thr Pro Thr Ser Gln Ala Ser Gly Arg Gly Phe Ser Leu Gln Lys Asn
225 230 235 240

His Gly Arg Leu Asp Glu Asp Ile Leu Met Pro Met
245 250

<210> 93

<211> 549

<212> DNA

<213> Streptococcus agalactiae

<400> 93

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gttattctaa gtccaaatag tcaagccatt ttaacaggaa cgattccagc ttttgaggaa 180
aaatacggta taaaagttaa gcttattcaa ggtgggacag ggcaactaat agatagatta 240
agtaaggagg gtaagcagtt gaaggcggat attttctttg gaggaaatta tacgcaattt 300
gaaagtcata aggcattggt tgagtcttac gtatcaaaga atgttcatac tgttattcca 360
gactatatcc atccgagtga tacggcgaca ctttatacta taaatgggag tgtcttgatt 420
gtaaataacg aattagctaa gggacttacc atcaagagtt atgaagattt attacagcct 480
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<210> 94

<211> 182

<212> PRT

<213> Streptococcus agalactiae

<400> 94

Met Lys Glu Lys Gln Ser Lys Arg Leu Ile Tyr Ile Leu Leu Ile Val

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Pro Ile Ile Phe Ile Ser Val Phe Thr Tyr Ser Ile Ser Gln Pro Ser

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25

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Lys Leu Leu Pro Pro Lys Glu Leu Val Ile Leu Ser Pro Asn Ser Gln

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Ala Ile Leu Thr Gly Thr Ile Pro Ala Phe Glu Glu Lys Tyr Gly Ile

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60

Lys Val Lys Leu Ile Gln Gly Gly Thr Gly Gln Leu Ile Asp Arg Leu

65

70

75

80

Ser Lys Glu Gly Lys Gln Leu Lys Ala Asp Ile Phe Phe Gly Gly Asn

85

90

95

Tyr Thr Gln Phe Glu Ser His Lys Ala Leu Phe Glu Ser Tyr Val Ser

100

105

110

Lys Asn Val His Thr Val Ile Pro Asp Tyr Ile His Pro Ser Asp Thr

115

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125

Ala Thr Pro Tyr Thr Ile Asn Gly Ser Val Leu Ile Val Asn Asn Glu

130

135

140

Leu Ala Lys Gly Leu Thr Ile Lys Ser Tyr Glu Asp Leu Leu Gln Pro

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150

155

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Ser Leu Lys Gly Lys Ile Ala Phe Ala Asp Pro Leu Glu Ser Thr Cys

165

170

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Lys His Ala Ser Leu Ala

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<210> 95

<211> 368

<212> DNA

<213> Streptococcus agalactiae

<400> 95

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<210> 96

<211> 122

<212> PRT

<213> Streptococcus agalactiae

<400> 96

Leu Leu Ser Asn Asp Asp Lys Arg Glu Arg Tyr Met Glu Gln Met Leu

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Phe Lys Ile Glu Asn Ala Thr Trp Gln Arg Val Val Arg Ala Leu Tyr

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Arg Lys Tyr Asn Lys Glu Phe Phe Thr Tyr Pro Ala Ala Lys Thr Asn

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His His Ala Phe Glu Ser Gly Leu Ala Tyr His Thr Ala Thr Met Val

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107

Arg Leu Ala Asp Ser Ile Gly Asp Ile Tyr Pro Glu Leu Asn Lys Ser
65 70 75 80

Leu Met Phe Ala Gly Ile Met Leu His Asp Leu Ala Lys Val Ile Glu
85 90 95

Leu Ser Gly Pro Asp Asn Thr Glu Tyr Thr Ile Arg Gly Asn Leu Ile
100 105 110

Gly His Ile Ser Leu Ile Asp Glu Glu Leu
115 120

<210> 97

<211> 753

<212> DNA

<213> Streptococcus agalactiae

<400> 97

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aatgaggata taaaaaagac atcctctcaa aaaagaaata agaaattacg attaccagct 180
gtatcatcaa aagattggaa cttgattttg gtcaatcgtg accataaaca tgaagaatta 240
agtccagatg tggtgctgt tgaaaatatt tatttgata aacgtattac gaagcaagct 300
actcagtttt tagaggctgc tagagcaatt gattcacgag aacatttaat ttcgggttat 360
cgtagtggtg cctatcagga gaagttgttc aattcttatg ttactcaaga gatgactagt 420
aacctaatt tgacgagggg acaagcagaa aagttggtaa aaacttactc tcagcctgca 480
ggtgctagt aacaccagac tggattagcg atggatatga gtactgtaga ttctttgaat 540
gagagcgatc ctagagtagt cagtcagttg aaaaagatag ctccacaata tgggtttgtc 600
ttacggtttc cggatggtaa aacagcagaa acaggggtag gttatgaaga ttggcattac 660
cgctatgttg gggtagagtc tgcaaaatat atgggtcaaac atcatttaac attagaagaa 720
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<210> 98

<211> 250

<212> PRT

<213> Streptococcus agalactiae

<400> 98

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Gln Ser Ser Ser Gln Lys Leu Arg Asn Glu Asp Ile Lys Lys Thr Ser
 35 40 45

Ser Gln Lys Arg Asn Lys Lys Leu Arg Leu Pro Ala Val Ser Ser Lys
 50 55 60

Asp Trp Asn Leu Ile Leu Val Asn Arg Asp His Lys His Glu Glu Leu
 65 70 75 80

Ser Pro Asp Val Val Pro Val Glu Asn Ile Tyr Leu Asp Lys Arg Ile
 85 90 95

Thr Lys Gln Ala Thr Gln Phe Leu Glu Ala Ala Arg Ala Ile Asp Ser
 100 105 110

Arg Glu His Leu Ile Ser Gly Tyr Arg Ser Val Ala Tyr Gln Glu Lys
 115 120 125

Leu Phe Asn Ser Tyr Val Thr Gln Glu Met Thr Ser Asn Pro Asn Leu
 130 135 140

Thr Arg Gly Gln Ala Glu Lys Leu Val Lys Thr Tyr Ser Gln Pro Ala
 145 150 155 160

Gly Ala Ser Glu His Gln Thr Gly Leu Ala Met Asp Met Ser Thr Val
 165 170 175

109

Asp Ser Leu Asn Glu Ser Asp Pro Arg Val Val Ser Gln Leu Lys Lys
180 185 190

Ile Ala Pro Gln Tyr Gly Phe Val Leu Arg Phe Pro Asp Gly Lys Thr
195 200 205

Ala Glu Thr Gly Val Gly Tyr Glu Asp Trp His Tyr Arg Tyr Val Gly
210 215 220

Val Glu Ser Ala Lys Tyr Met Val Lys His His Leu Thr Leu Glu Glu
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Tyr Ile Thr Leu Leu Lys Glu Asn Asn Gln
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<210> 99

<211> 351

<212> DNA

<213> Streptococcus agalactiae

<400> 99

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cagaccttaa gagaactttt tagtcagatg ggtgatattc aggtatttta ttttaatgaa 240
tttgaatctg atattaaaat gaccagtggg ggtcttgtct tggaagatgg cagaattttc 300
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<210> 100

<211> 116

<212> PRT

<213> Streptococcus agalactiae

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Tyr Gly Ile Ile Thr Val Met Lys Asn Lys Lys Ile Leu Phe Gly Thr
20 25 30

Gly Leu Ala Gly Val Gly Leu Leu Ala Ala Ala Gly Tyr Thr Leu Thr
35 40 45

Lys Lys Val Thr Asp Tyr Lys Arg Gln Gln Ile Thr Gln Thr Leu Arg
50 55 60

Glu Leu Phe Ser Gln Met Gly Asp Ile Gln Val Phe Tyr Phe Asn Glu
65 70 75 80

Phe Glu Ser Asp Ile Lys Met Thr Ser Gly Gly Leu Val Leu Glu Asp
85 90 95

Gly Arg Ile Phe Glu Phe Ile Tyr Arg Gln Gly Val Leu Asp Tyr Val
100 105 110

Glu Val Ser Lys
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<210> 101

<211> 310

<212> DNA

<213> Streptococcus agalactiae

<400> 101

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cagtatagtc agctacattt ggcagggtgtg tcaactgcta gtaatttatg gactccgttt 180
ttcgctttat tagtaggtat gatttcagca ttagtaccag tagttgggtca acatttgggt 240
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<210> 102

<211> 103

<212> PRT

<213> Streptococcus agalactiae

<400> 102

Met Tyr Gln Thr Gln Thr Asn Lys Glu Lys Phe Val Leu Phe Leu Lys

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Leu Phe Ile Pro Val Leu Ile Tyr Gln Phe Ala Asn Phe Ser Ala Thr

20

25

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Phe Ile Asp Ser Val Met Thr Gly Gln Tyr Ser Gln Leu His Leu Ala

35

40

45

Gly Val Ser Thr Ala Ser Asn Leu Trp Thr Pro Phe Phe Ala Leu Leu

50

55

60

Val Gly Met Ile Ser Ala Leu Val Pro Val Val Gly Gln His Leu Gly

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70

75

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Arg Gly Asn Lys Glu Gln Ile Arg Thr Glu Phe His Gln Phe Leu Tyr

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90

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Leu Gly Leu Ile Leu Ser Leu

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<210> 103

<211> 1098

<212> DNA

<213> Streptococcus agalactiae

<400> 103

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 ggtggttttg aaacttttgt ttcagaattg attaatcatc aaaaaagttc cgacataaaa 180

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taccatgttg catgccttag tgataaagaa catcatactc attttaactt tgctgacgct 240
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atggccatta attatgccct tgacttggtt aagacacatg atttaaaaga gcctattttt 360
tatatttttag gaaatacaat tgggtgccttt atttggcatt ttgccaataa aatacataaa 420
gtcgggtggtt tattgtatgt taatccggat gggttagagt ggaagcgatc aaagtgggtct 480
cgtcccacac agcgttattht aaaatacgcc gaaaaatgta tgactaaaaa tgcagacctt 540
attattttctg ataattattgg tattgaaaat tacattcaat ctacctactc taatgtgaag 600
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<210> 104

<211> 366

<212> PRT

<213> Streptococcus agalactiae

<400> 104

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Ser Arg Gly Leu Pro Ala Arg Tyr Gly Gly Phe Glu Thr Phe Val Ser

35 40 45

Glu Leu Ile Asn His Gln Lys Ser Ser Asp Ile Lys Tyr His Val Ala

50 55 60

Cys Leu Ser Asp Lys Glu His His Thr His Phe Asn Phe Ala Asp Ala

65 70 75 80

[illegible]

Asn Asn Pro Tyr Phe Glu Lys Leu Ser Leu Lys Thr Asn Leu Gln Gln
275 280 285

Asp Lys Arg Val Lys Phe Val Gly Thr Leu Tyr Glu Lys Asp Leu Leu
 290 295 300

Asp Tyr Val Arg Gln Gln Ala Phe Ala Tyr Ile His Gly His Glu Val
 305 310 315 320

Gly Gly Thr Asn Pro Gly Leu Leu Glu Ala Leu Ala Asn Thr Asp Leu
 325 330 335

Asn Leu Val Leu Asp Val Asp Phe Asn Lys Ser Val Ala Gly Leu Ser
 340 345 350

Ser Phe Tyr Trp Thr Lys Lys Glu Gly Asp Leu Ala Lys Leu
 355 360 365

<210> 105

<211> 546

<212> DNA

<213> Streptococcus agalactiae

<400> 105

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 gagttagaag gctggaaaat tgtaaaaaac gacaaaaact taggctggcg tttaaatttt 240
 cgtcaattac ttattgatgt gttagcctat gaggttgact atgtcttttt tagtgatcaa 300
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 ccacattttc taactttttc ttctagtgat agaatcagtc agtatcctaa agtatatgat 480
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<210> 106

<211> 181

<212> PRT

<213> Streptococcus agalactiae

<400> 106

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 20 25 30

Leu Lys Pro Asp Tyr Val Leu Leu Arg Asp Asp Cys Ser Thr Asp Glu
 35 40 45

Thr Val Asn Val Val Asn Asn Tyr Ile Ala Lys His Glu Leu Glu Gly
 50 55 60

Trp Lys Ile Val Lys Asn Asp Lys Asn Leu Gly Trp Arg Leu Asn Phe
 65 70 75 80

Arg Gln Leu Leu Ile Asp Val Leu Ala Tyr Glu Val Asp Tyr Val Phe
 85 90 95

Phe Ser Asp Gln Asp Asp Ile Trp Tyr Leu Asp Lys Asn Glu Arg Gln
 100 105 110

Phe Ala Ile Met Ser Asp Asn Pro Gln Ile Glu Val Leu Ser Ala Asp
 115 120 125

Val Asp Ile Lys Thr Met Ser Thr Glu Ala Ser Val Pro His Phe Leu
 130 135 140

Thr Phe Ser Ser Ser Asp Arg Ile Ser Gln Tyr Pro Lys Val Tyr Asp
 145 150 155 160

Tyr Gln Thr Phe Arg Pro Gly Trp Thr Ile Ala Met Lys Arg Asp Phe
 165 170 175

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 Streptococcus agalactiae
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 Met Arg Ser Asn Met Val Lys Thr Ala Val Leu Met Ala Thr Tyr Asn
 1 5 10 15
 Gly Glu Lys Phe Ile Ser Glu Gln Leu Asp Ser Ile Arg Gln Gln Thr
 20 25 30
 Leu Lys Pro Asp Tyr Val Leu Leu Arg Asp Asp Cys Ser Thr Asp Glu
 35 40 45
 Thr Val Asn Val Val Asn Asn Tyr Ile Ala Lys His Glu Leu Glu Gly
 50 55 60
 Trp Lys Ile Val Lys Asn Asp Lys Asn Leu Gly Trp Arg Leu Asn Phe
 65 70 75 80
 Arg Gln Leu Leu Ile Asp Val Leu Ala Tyr Glu Val Asp Tyr Val Phe
 85 90 95
 Phe Ser Asp Gln Asp Asp Ile Trp Tyr Leu Asp Lys Asn Glu Arg Gln
 100 105 110
 Phe Ala Ile Met Ser Asp Asn Pro Gln Ile Glu Val Leu Ser Ala Asp
 115 120 125
 Val Asp Ile Lys Thr Met Ser Thr Glu Ala Ser Val Pro His Phe Leu
 130 135 140
 Thr Phe Ser Ser Ser Asp Arg Ile Ser Gln Tyr Pro Lys Val Tyr Asp
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 Tyr Gln Thr Phe Arg Pro Gly Trp Thr Ile Ala Met Lys Arg Asp Phe
 165 170 175

Ala Gln Ala Ile Ala

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<210> 107

<211> 639

<212> DNA

<213> Streptococcus agalactiae

<400> 107

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gccctaggta tcgattctgc tactgttcga cgtgattttt cttatttttg tgaactagga 180
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cattatcggt tccacgatcg caataaaatg caaatttcaa tggcttttga tttagatagc 360
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<210> 108

<211> 212

<212> PRT

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<400> 108

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Ala Ser Ser Lys Gln Ile Ala Asp Ala Leu Gly Ile Asp Ser Ala Thr

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Val Arg Arg Asp Phe Ser Tyr Phe Gly Glu Leu Gly Arg Arg Gly Phe
50 55 60

Gly Tyr Asp Val Lys Lys Leu Met Asn Phe Phe Ala Glu Ile Leu Asn
65 70 75 80

Asp His Ser Thr Thr Asn Val Met Leu Val Gly Cys Gly Asn Ile Gly
85 90 95

Arg Ala Leu Leu His Tyr Arg Phe His Asp Arg Asn Lys Met Gln Ile
100 105 110

Ser Met Ala Phe Asp Leu Asp Ser Asn Asp Leu Val Gly Lys Thr Thr
115 120 125

Glu Asp Gly Ile Pro Val Tyr Gly Ile Ser Thr Ile Asn Asp His Leu
130 135 140

Ile Asp Ser Asp Ile Glu Thr Ala Ile Leu Thr Val Pro Ser Thr Glu
145 150 155 160

Ala Gln Glu Val Ala Asp Ile Leu Val Lys Ala Gly Ile Lys Gly Ile
165 170 175

Leu Ser Phe Ser Pro Val His Leu Thr Leu Pro Lys Asp Ile Ile Val
180 185 190

Gln Tyr Val Asp Leu Thr Ser Glu Leu Gln Thr Leu Leu Tyr Phe Met
195 200 205

Asn Gln Gln Arg
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<210> 109

<211> 476

<212> DNA

<213> Streptococcus agalactiae

<400> 109

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gaaaaataca ctggagttga tggatatcaat ggaaaaataa atggaacacc tgttacaatg 240
gcaggcaagt acgggggatca ccttgggtatt attgathtag gacttagtta tactaatgga 300
aaatggcaag tctccgaaag cagtgcataa atccgtaaaa ttgatatgaa ctcaacaact 360
gctgacgagc gtatcattgc attggctaag gaagcacacg atggcactat caactatggt 420
cgccaacaag taggtacaac aactgcgcca attacaagtt actttgcact agttaa      476

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<210> 110

<211> 158

<212> PRT

<213> Streptococcus agalactiae

<400> 110

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Met Gly Ala Lys Gly Ala Asp Val Ile Leu Val Leu Ser His Ser Gly
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Ile Gly Asp Asp Arg Tyr Glu Glu Gly Glu Glu Asn Val Gly Tyr Gln
      20             25            30

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Ile Ala Ser Ile Lys Gly Val Asp Ala Val Val Thr Gly His Ser His
      35             40            45

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Ala Glu Phe Pro Ser Gly Asn Gly Thr Gly Phe Tyr Glu Lys Tyr Thr
      50             55            60

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Gly Val Asp Gly Ile Asn Gly Lys Ile Asn Gly Thr Pro Val Thr Met
      65             70            75            80

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119

Ala Gly Lys Tyr Gly Asp His Leu Gly Ile Ile Asp Leu Gly Leu Ser
85 90 95

Tyr Thr Asn Gly Lys Trp Gln Val Ser Glu Ser Ser Ala Lys Ile Arg
100 105 110

Lys Ile Asp Met Asn Ser Thr Thr Ala Asp Glu Arg Ile Ile Ala Leu
115 120 125

Ala Lys Glu Ala His Asp Gly Thr Ile Asn Tyr Val Arg Gln Gln Val
130 135 140

Gly Thr Thr Thr Ala Pro Ile Thr Ser Tyr Phe Ala Leu Val
145 150 155

<210> 111

<211> 170

<212> DNA

<213> Streptococcus agalactiae

<400> 111

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gcgactggaa ttggagctgc actttttatc attataggta tgctagttaa 170

<210> 112

<211> 56

<212> PRT

<213> Streptococcus agalactiae

<400> 112

Met Ser Ile Arg Phe Gln Ile Ser Leu Lys Tyr Asp Lys Ile Lys Gln
1 5 10 15

Ile Val Ser Asp Cys Leu Ser Leu Phe Phe Arg Glu Val Phe Met Asn
20 25 30

120

Thr Asn Thr Ile Lys Lys Val Val Ala Thr Gly Ile Gly Ala Ala Leu

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Phe Ile Ile Ile Gly Met Leu Val

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<211> 242

<212> DNA

<213> Streptococcus agalactiae

<400> 113

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gaacctagtg aagtaacctt tcattttatac aattcttttg ctaaaactta ccaaggacac 180
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aa 242

<210> 114

<211> 80

<212> PRT

<213> Streptococcus agalactiae

<400> 114

Met Lys His Leu Lys Phe Gln Ser Val Phe Asp Ile Ile Gly Pro Val

1

5

10

15

Met Ile Gly Pro Ser Ser Ser His Thr Ala Gly Ala Val Arg Ile Gly

20

25

30

Lys Val Val His Ser Ile Phe Gly Glu Pro Ser Glu Val Thr Phe His

35

40

45

Leu Tyr Asn Ser Phe Ala Lys Thr Tyr Gln Gly His Gly Thr Asp Lys

50

55

60

Ala Leu Val Ala Gly Ile Leu Gly Met Asp Thr Asp Asn Pro Asp Ile
 65 70 75 80

<210> 115

<211> 122

<212> DNA

<213> Streptococcus agalactiae

<400> 115

gtgtcagaag gtgttttaat gtttctaaaa gaagatgacg tagagacttt tcttcatatc 60
 ctgacaaatt catttagcca atttatggca caatttgatt tgtgtcataa ggaaatgatt 120
 aa 122

<210> 116

<211> 83

<212> DNA

<213> Streptococcus agalactiae

<400> 116

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 atgatgtccg acaaacgttt taa 83

<210> 117

<211> 27

<212> PRT

<213> Streptococcus agalactiae

<400> 117

Met Thr Tyr Lys Asp Tyr Thr Gly Leu Asp Arg Thr Glu Leu Leu Ser
 1 5 10 15

Lys Val Arg His Met Met Ser Asp Lys Arg Phe

20

25

<210> 118

<211> 94

<212> DNA

<213> Streptococcus agalactiae

<400> 118

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tatttagaac aactaaaaga ggtaaattcct ttaa 94

<210> 119

<211> 31

<212> PRT

<213> Streptococcus agalactiae

<400> 119

Met Ser Trp Val Leu Glu Thr Val Leu Ser Ile Ile Leu Ala Ile Lys

1

5

10

15

Glu Thr Lys Met Tyr Leu Glu Gln Leu Lys Glu Val Asn Pro Leu

20

25

30

<210> 120

<211> 1230

<212> DNA

<213> Streptococcus agalactiae

<400> 120

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gctggtggag catttgctag ttttgctcatg aatcataatg acaatattcc aaatggtggt 120
gtcactaaaa ctagtaaagt aaattataat aacataacgc ctacaacaaa agctgttaaa 180
aaggtacaaa atagtgttgt ttctgttatc aattataaac aacaagagag tcgttctgac 240

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ctatcagact tctatagtca ttttttttgt aatcaggggg gcaacactga taagggctta 300
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gtcactaata accacgtcat tgatggggct aaacaaattg aaattcaact agctgatggc 420
tcaaaagcag ttgggaaact tgttgggtca gatacctact ctgatttagc cgtcgtcaaa 480
attccatcag ataaagtttc aaatattgca gaatttgctg attcatcaaa actcaacatt 540
ggtgaaactg ctatagcgat cggaagccct cttggaactg agtatgcaaa ttctgtaact 600
caaggtattg tatctagttt aaaaagaact gtaacaatga ctaatgaaga aggacaaaca 660
gtttctacaa atgctatcca gacggatgct gctatcaatc ctggtaattc aggtggagca 720
cttatcaata ttgaaggaca ggttattgga attaattcta gtaaaatttc ttctacatca 780
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gatttagcta aacaacgagc aaataactaa                                1230

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<210> 121

<211> 409

<212> PRT

<213> Streptococcus agalactiae

<400> 121

Met Lys Lys Lys Leu Val Ser Ser Leu Leu Lys Cys Ser Leu Ile Ile

1

5

10

15

Ile Val Ser Phe Ala Gly Gly Ala Phe Ala Ser Phe Val Met Asn His

20

25

30

Asn Asp Asn Ile Pro Asn Gly Gly Val Thr Lys Thr Ser Lys Val Asn

35

40

45

124

Tyr Asn Asn Ile Thr Pro Thr Thr Lys Ala Val Lys Lys Val Gln Asn
50 55 60

Ser Val Val Ser Val Ile Asn Tyr Lys Gln Gln Glu Ser Arg Ser Asp
65 70 75 80

Leu Ser Asp Phe Tyr Ser His Phe Phe Gly Asn Gln Gly Gly Asn Thr
85 90 95

Asp Lys Gly Leu Gln Val Tyr Gly Glu Gly Ser Gly Val Ile Tyr Lys
100 105 110

Lys Asp Gly Lys Asn Ala Tyr Val Val Thr Asn Asn His Val Ile Asp
115 120 125

Gly Ala Lys Gln Ile Glu Ile Gln Leu Ala Asp Gly Ser Lys Ala Val
130 135 140

Gly Lys Leu Val Gly Ser Asp Thr Tyr Ser Asp Leu Ala Val Val Lys
145 150 155 160

Ile Pro Ser Asp Lys Val Ser Asn Ile Ala Glu Phe Ala Asp Ser Ser
165 170 175

Lys Leu Asn Ile Gly Glu Thr Ala Ile Ala Ile Gly Ser Pro Leu Gly
180 185 190

Thr Glu Tyr Ala Asn Ser Val Thr Gln Gly Ile Val Ser Ser Leu Lys
195 200 205

Arg Thr Val Thr Met Thr Asn Glu Glu Gly Gln Thr Val Ser Thr Asn
210 215 220

Ala Ile Gln Thr Asp Ala Ala Ile Asn Pro Gly Asn Ser Gly Gly Ala
225 230 235 240

Leu Ile Asn Ile Glu Gly Gln Val Ile Gly Ile Asn Ser Ser Lys Ile
245 250 255

125

Ser Ser Thr Ser Asn Gln Thr Ser Gly Gln Ser Ser Gly Asn Ser Val
260 265 270

Glu Gly Met Gly Phe Ala Ile Pro Ser Asn Asp Val Val Lys Ile Ile
275 280 285

Asn Gln Leu Glu Ser Asn Gly Gln Val Glu Arg Pro Ala Leu Gly Ile
290 295 300

Ser Met Ala Gly Leu Ser Asn Leu Pro Ser Asp Val Ile Ser Lys Leu
305 310 315 320

Lys Ile Pro Ser Asn Val Thr Asn Gly Ile Val Val Ala Ser Ile Gln
325 330 335

Ser Gly Met Pro Ala Gln Gly Lys Leu Lys Lys Tyr Asp Val Ile Thr
340 345 350

Lys Val Asp Asp Lys Glu Val Ala Ser Pro Ser Asp Leu Gln Ser Leu
355 360 365

Leu Tyr Gly His Gln Val Gly Asp Ser Ile Thr Val Thr Phe Tyr Arg
370 375 380

Gly Glu Asn Lys Gln Thr Val Thr Ile Lys Leu Thr Lys Thr Ser Lys
385 390 395 400

Asp Leu Ala Lys Gln Arg Ala Asn Asn
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<210> 122

<211> 1923

<212> DNA

<213> Streptococcus agalactiae

<400> 122

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attcctcatt atgagggttaa tctaactatt cacaatgata atagtgctga ttttacagag 180
 aaggttactt accaatttga ttcgtcctat aatggacagt atgtcacggt aggtacggcg 240
 ggtaagttat ctgacaattt tgatattaat aataagccac aggttgaagt ttcaattaat 300
 ggtaaagtaa ggaaagttag ttaccagata gaagatttgg aggatggcta ccgtttgaaa 360
 gtgtttaatg gtggtgaagc aggtgatact gttaaagtca atgttcagt gaaactaaaa 420
 aatgttctat ttatgcataa ggatgttggg gaacttaact ggattcctat tagcgactgg 480
 gataaaacgt tagagaaagt agatttttgg atatcaactg aaaaaaagggt tgctctttct 540
 cgtctttggg ggcacttggg ttatcttaaa actcctocta aaataagaca aaataataat 600
 cgttaccatt tgacagcttt taatgtaaac aaacgattag aatttcattg ttattgggat 660
 agatcttatt ttaatctacc tacaacaggt aaaaataatt acaagaaaaa aattgaacat 720
 caagagaaga taatagagcg tcatggtttt atcctaagtt tcttggttaag gatattatta 780
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 taa 1923

<210> 123

<211> 640

<212> PRT

<213> Streptococcus agalactiae

<400> 123

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 35 40 45

Thr Ile His Asn Asp Asn Ser Ala Asp Phe Thr Glu Lys Val Thr Tyr
 50 55 60

Gln Phe Asp Ser Ser Tyr Asn Gly Gln Tyr Val Thr Leu Gly Thr Ala
 65 70 75 80

Gly Lys Leu Ser Asp Asn Phe Asp Ile Asn Asn Lys Pro Gln Val Glu
 85 90 95

Val Ser Ile Asn Gly Lys Val Arg Lys Val Ser Tyr Gln Ile Glu Asp
 100 105 110

Leu Glu Asp Gly Tyr Arg Leu Lys Val Phe Asn Gly Gly Glu Ala Gly
 115 120 125

Asp Thr Val Lys Val Asn Val Gln Trp Lys Leu Lys Asn Val Leu Phe
 130 135 140

Met His Lys Asp Val Gly Glu Leu Asn Trp Ile Pro Ile Ser Asp Trp
 145 150 155 160

Asp Lys Thr Leu Glu Lys Val Asp Phe Trp Ile Ser Thr Asp Lys Lys
 165 170 175

Val Ala Leu Ser Arg Leu Trp Gly His Leu Gly Tyr Leu Lys Thr Pro
 180 185 190

117 123 127 131 135 139 143 147 151 155 159 163 167 171 175 179 183 187 191 195 199 203 207 211 215 219 223 227 231 235 239 243 247 251 255 259 263 267 271 275 279 283 287 291 295 299 303 307 311 315 319 323 327 331 335 339 343 347 351 355 359 363 367 371 375 379 383 387 391 395 399 403 407 411 415 419 423 427 431 435 439 443 447 451 455 459 463 467 471 475 479 483 487 491 495 499 503 507 511 515 519 523 527 531 535 539 543 547 551 555 559 563 567 571 575 579 583 587 591 595 599 603 607 611 615 619 623 627 631 635 639 643 647 651 655 659 663 667 671 675 679 683 687 691 695 699 703 707 711 715 719 723 727 731 735 739 743 747 751 755 759 763 767 771 775 779 783 787 791 795 799 803 807 811 815 819 823 827 831 835 839 843 847 851 855 859 863 867 871 875 879 883 887 891 895 899 903 907 911 915 919 923 927 931 935 939 943 947 951 955 959 963 967 971 975 979 983 987 991 995 999

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Gln	Glu	Lys	Ile	Ile	Glu	Arg	His	Gly	Phe	Ile	Leu	Ser	Phe	Leu	Leu					
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Arg	Ile	Leu	Leu	Pro	Ser	Phe	Phe	Ile	Ile	Val	Thr	Leu	Phe	Ile	Ser					
				260								265				270				
Ile	Arg	Val	Phe	Leu	Phe	Arg	Lys	Lys	Val	Asn	Lys	Tyr	Gly	Gln	Phe					
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Glu	Leu	Thr	Gln	Ser	Ile	Tyr	Ser	Met	Ser	Phe	Lys	Asn	Phe	Gln	Asp					
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Glu	Glu	Lys	Lys	Thr	His	Leu	Ile	Ser	Gln	Glu	Gln	Leu	Ile	Gln	Ser					
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Lys Lys Gln His Lys Ala Ser Asp Leu Gln Asn Gln Met Arg Arg Arg
 405 410 415

Gly Ser Asn Ala Leu Ser Arg Ile Thr Arg Leu Thr Arg Leu Ile Ser
 420 425 430

Lys Asp Asn Ile Asn Ser Leu Arg Arg Lys Gly Ile Ser Ser Pro Tyr
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Arg Lys Met Ser Ser Glu Glu Ser Lys Glu Leu Ser Arg Leu Lys Arg
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Phe Ser Tyr Leu Ser Pro Leu Ile Ser Phe Val Val Ile Ile Tyr Thr
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Leu Phe Leu Asn Tyr Phe Thr Tyr Phe Cys Ile Tyr Leu Leu Leu Phe
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Gly Val Ile Leu Leu Leu Asn Lys Ile Ile Phe Met Met Thr Arg Lys
 500 505 510

Ile Ser Asn Gly Tyr Ile Val Thr Glu Asp Gly Ala Ser Arg Val Tyr
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Gln Trp Thr Ser Phe Arg Asn Met Leu Arg Asp Ile Lys Ser Phe Asp
 530 535 540

Arg Ser Glu Leu Glu Ser Ile Val Leu Trp Asn Arg Ile Leu Val Tyr
 545 550 555 560

Ala Thr Leu Phe Gly Tyr Ala Asp Arg Val Glu Lys Val Leu Arg Val
 565 570 575

Asn Gln Ile Asp Ile Pro Glu Arg Phe Ala Asn Ile Asp Ser His Arg
 580 585 590

Phe Ala Ile Ser Val Asn Gln Ser Ser Asn His Phe Ser Thr Ile Thr
 595 600 605

Glu Asp Val Ser His Ala Ser Asn Phe Ser Val Asn Ser Gly Gly Ser
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<210> 124

<211> 2712

<212> DNA

<213> Streptococcus agalactiae

<400> 124

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Leu Asp Lys Asn Lys Tyr Lys Ile Glu Leu Thr Val Glu Gly Lys Thr
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Thr Val Glu Thr Lys Glu Leu Asn Gln Pro Leu Asp Val Val Val Leu
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<213> Streptococcus agalactiae

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Arg Val Thr Pro Leu Tyr Arg Asn Asp Thr Asp Leu Val Pro Phe Ala
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<211> 206

<213> Streptococcus agalactiae

Met Lys Asn Tyr Arg Lys Leu Ile Val Leu Leu Leu Leu Ile Phe Phe
1 5 10 15

Ala Ile Phe Met Gly Ala Tyr Ala Tyr Thr His Ile Val Glu Lys Arg
20 25 30

Ser Leu Thr Ser Asn Thr Ile Glu Lys Thr Leu Pro Val Val Asn Gln
35 40 45

Ile Lys Pro Gln Thr Ile Lys Glu Tyr Gln Asn Tyr Leu Thr Lys Val
50 55 60

Ala Lys Arg Asn Val Leu Pro Val Asp Ile Pro Gln Ala Leu Asn Asn
65 70 75 80

Glu Lys Val Glu Ile Thr Ala Thr Asp Gly Met Gln Thr Phe Thr Trp
85 90 95

Asn Asp Lys Asn Asn Pro Lys Gln Lys Val Ile Phe Tyr Val His Gly
100 105 110

Gly Ser Tyr Ile His Gln Ala Ser Glu Leu Gln Tyr Ile Phe Val Asn
115 120 125

Lys Leu Ala Lys Lys Leu Asp Ala Lys Val Val Phe Pro Ile Tyr Pro
130 135 140

Lys Ala Pro Thr Tyr Asn Tyr Ser Asp Ala Ile Pro Lys Ile Lys Lys
145 150 155 160

Leu Tyr Gln Asn Thr Leu Ala Ser Val Thr Ser His Lys Gln Ile Ile
165 170 175

Leu Val Gly Glu Ser Ala Gly Gly Gly Leu Ala Leu Gly Ile Ala Asp

180

185

190

Asn Leu Ala Arg Ser Ile Ser Asn Asn Gln Lys Lys Leu Phe

195

200

205

<210> 132

<211> 885

<212> DNA

<213> Streptococcus agalactiae

<400> 132

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 atgaagttaa aacatatattgt cttaggatta gccttaacaa cacttttagg agtcacattt 120
 agtaatcaag aagtttcagc aagctcaact tcaagtaaag ttgttaaagt tgggtgttatg 180
 accttttctg acactgaaaa agcacgttg gataaaattg aaaagctagt aggtgataaa 240
 gctaaaatca aatttacaga atttacagat tatacacaac caaatcaagc gacagccaat 300
 aaggatgtgg atattaatgc ctttcaacat tacaatttct tagaaaactg gaataaggaa 360
 aataagaaaa acttaattcc acttgaaaag acttacttag ctccaattcg tatctattct 420
 gagaaggtaa aatctcttaa aaaattgaaa aaaggagcca ctattgcaat tccaaatgat 480
 gcaacaaatg gtagccgtgc attgtatgtc cttcagtcag caggtttaat caaattgaat 540
 gtttctggta agaagggtgc aacagttgct aatatcacat ctaataaaaa ggatattaat 600
 attcaggagt tagatgcgag tcaaacacca cgtgcactca aagatgtaga tgcagctatt 660
 attaataata catacattga gcaagctaatt ttaaaacctt cagatgctat ctttgttgag 720
 aaatcagata aaaattcaaa acaatggatt aatatcattg cgggacgtaa aaattggaaa 780
 aagcaaaaga acgctaaagc tatccaagct atcttgatg cttatcacac agatgaagtg 840
 aaaaaagtta tcaaagatac ttcagctgat attccacaat ggtaa 885

<210> 133

<211> 294

<212> PRT

<213> Streptococcus agalactiae

<400> 133

Met Ile Leu Ile Thr Ser Tyr Gly Ile Ile Ser Leu Ser Gln Lys Leu

1

5

10

15

Thr Pro Arg Ala Leu Lys Asp Val Asp Ala Ala Ile Ile Asn Asn Thr
210 215 220

145

Tyr Ile Glu Gln Ala Asn Leu Lys Pro Ser Asp Ala Ile Phe Val Glu
225 230 235 240

Lys Ser Asp Lys Asn Ser Lys Gln Trp Ile Asn Ile Ile Ala Gly Arg
245 250 255

Lys Asn Trp Lys Lys Gln Lys Asn Ala Lys Ala Ile Gln Ala Ile Leu
260 265 270

Asp Ala Tyr His Thr Asp Glu Val Lys Lys Val Ile Lys Asp Thr Ser
275 280 285

Ala Asp Ile Pro Gln Trp
290

<210> 134

<211> 1350

<212> DNA

<213> Streptococcus agalactiae

<400> 134

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aatagggcag ccatgtatgg agcaaaagtc ctgttaattg aaggtggaca agtaggtgga 120
acttgtgtta acttaggttg tgtacctaaag aaaatcatgt ggtatggtgc acaagtttct 180
gagacactcc ataagtatag ttcagggttat ggttttgaag ccaataatct tagttttgat 240
tttactactc taaaagctaa tcgcgatgct tacgtgcagc ggtctagaca gtcgtatgcc 300
gctaattttg agcgtaatgg ggtcgaaaag attgatggat ttgctcgttt tattgataac 360
catactattg aagtgaatgg tcagcaatat aaagctcctc acattactat tgcaacagggt 420
ggacaccctc tttaccctga tattattgga agtgaacttg gtgagacttc tgatgatttt 480
tttggtatggg agaccttacc aaattctata ttgattgttg gggcgggcta tatcgcgga 540
gaacttgctg gagtggttaa tgaattaggc gttgaaaccc atcttgcat tagaaaagac 600
catattctac gcggtattga tgacatggta acaagtggag ttatggctga aatggagaaa 660
tcaggatatct ctttacctgc taacctatga cctaaatctc ttaaaccgca tgaaggtggc 720
aagttgattt ttgaagctga aaatgggaaa acgcttgctg ttgatcgtgt aatatgggct 780
atcggccgtg gaccaaagt agacatggga cttgaaaata ccgatattgt tttaaatgat 840
aaagattata tcaaaacaga tgaatttgag aatacttctg tagatggcgt gtatgctatt 900

ggagatgtta atgggaaaat tgccttgaca ccggtagcaa ttgcagcagg tcgtcgctta 960
 tcagaaagac tttttaatca taaagataac gaaaaattag attaccataa tgtaccttca 1020
 gttattttta ctcaccctgt aattgggacg gtaggacttt cagaagcagc agctatcgag 1080
 caatttgaa aagataatat caaagtctat acatcaactt ttacctctat gtatacggct 1140
 gttaccagta atcgccaagc agttaagatg aagctcataa ccctaggaaa agaggaaaaa 1200
 gttattgggc ttcattggtgt tgggttatggt attgatgaaa tgattcaagg tttttcagtt 1260
 gctatcaaaa tgggggctac taaagcagac tttgatgata ctgttgctat tcaccaact 1320
 ggatctgagg aatttggtac aatgcgctaa 1350

<210> 135

<211> 449

<212> PRT

<213> Streptococcus agalactiae

<400> 135

Met Ser Asn Gln Tyr Asp Tyr Ile Val Ile Gly Gly Gly Ser Ala Gly
 1 5 10 15

Ser Gly Thr Ala Asn Arg Ala Ala Met Tyr Gly Ala Lys Val Leu Leu
 20 25 30

Ile Glu Gly Gly Gln Val Gly Gly Thr Cys Val Asn Leu Gly Cys Val
 35 40 45

Pro Lys Lys Ile Met Trp Tyr Gly Ala Gln Val Ser Glu Thr Leu His
 50 55 60

Lys Tyr Ser Ser Gly Tyr Gly Phe Glu Ala Asn Asn Leu Ser Phe Asp
 65 70 75 80

Phe Thr Thr Leu Lys Ala Asn Arg Asp Ala Tyr Val Gln Arg Ser Arg
 85 90 95

Gln Ser Tyr Ala Ala Asn Phe Glu Arg Asn Gly Val Glu Lys Ile Asp
 100 105 110

Gly Phe Ala Arg Phe Ile Asp Asn His Thr Ile Glu Val Asn Gly Gln
 115 120 125

117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

147

Gln Tyr Lys Ala Pro His Ile Thr Ile Ala Thr Gly Gly His Pro Leu
130 135 140

Tyr Pro Asp Ile Ile Gly Ser Glu Leu Gly Glu Thr Ser Asp Asp Phe
145 150 155 160

Phe Gly Trp Glu Thr Leu Pro Asn Ser Ile Leu Ile Val Gly Ala Gly
165 170 175

Tyr Ile Ala Ala Glu Leu Ala Gly Val Val Asn Glu Leu Gly Val Glu
180 185 190

Thr His Leu Ala Phe Arg Lys Asp His Ile Leu Arg Gly Phe Asp Asp
195 200 205

Met Val Thr Ser Glu Val Met Ala Glu Met Glu Lys Ser Gly Ile Ser
210 215 220

Leu His Ala Asn His Val Pro Lys Ser Leu Lys Arg Asp Glu Gly Gly
225 230 235 240

Lys Leu Ile Phe Glu Ala Glu Asn Gly Lys Thr Leu Val Val Asp Arg
245 250 255

Val Ile Trp Ala Ile Gly Arg Gly Pro Asn Val Asp Met Gly Leu Glu
260 265 270

Asn Thr Asp Ile Val Leu Asn Asp Lys Asp Tyr Ile Lys Thr Asp Glu
275 280 285

Phe Glu Asn Thr Ser Val Asp Gly Val Tyr Ala Ile Gly Asp Val Asn
290 295 300

Gly Lys Ile Ala Leu Thr Pro Val Ala Ile Ala Ala Gly Arg Arg Leu
305 310 315 320

Ser Glu Arg Leu Phe Asn His Lys Asp Asn Glu Lys Leu Asp Tyr His
325 330 335

147-148-149-150-151-152-153-154-155-156-157-158-159-160

148

Asn Val Pro Ser Val Ile Phe Thr His Pro Val Ile Gly Thr Val Gly
340 345 350

Leu Ser Glu Ala Ala Ala Ile Glu Gln Phe Gly Lys Asp Asn Ile Lys
355 360 365

Val Tyr Thr Ser Thr Phe Thr Ser Met Tyr Thr Ala Val Thr Ser Asn
370 375 380

Arg Gln Ala Val Lys Met Lys Leu Ile Thr Leu Gly Lys Glu Glu Lys
385 390 395 400

Val Ile Gly Leu His Gly Val Gly Tyr Gly Ile Asp Glu Met Ile Gln
405 410 415

Gly Phe Ser Val Ala Ile Lys Met Gly Ala Thr Lys Ala Asp Phe Asp
420 425 430

Asp Thr Val Ala Ile His Pro Thr Gly Ser Glu Glu Phe Val Thr Met
435 440 445

Arg

<210> 136

<211> 1317

<212> DNA

<213> Streptococcus agalactiae

<400> 136

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gcttgtgtag acagtagtca atctgttatg gctgccgaga aggataaagt cgaaattacg 120
tggtggggctt ttccaacctt tactcaagaa aaggctaagg atggagtagg tacttatgag 180
aaaaaagtca tcaaggcttt tgaaaagaaa aatcctaata taaaagtaaa actagagaca 240
attgatttca catctggacc tgaaaaaatc actacagcaa ttgaagcagg gacagcacct 300
gatgtgcttt ttgatgcacc agggcggaatt attcaatatg gtaaaaatgg taaattagca 360

gatttgaatg atttattttac agaccaattht attaaggatg tcaataataa gaacatcatt 420
 caagcttcta agtctggcga taaagcctac atgtatccaa taagttctgc cccattttat 480
 atggcgttca ataaaaaaat gcttaaagat gcaggagttt tgaaacttgt aaaagaaggt 540
 tggactacta gtgattttga aaaagtacta aaagcactaa aaaataaagg ctatacacca 600
 ggttcattct ttgcaaacgg gcaaggagga gatcaaggac cacgtgcatt ttttgctaatt 660
 ctttatagtgt ctccaataac agataaagaa gtaacaaaat ataccactga cactaaaaat 720
 tctgtaaaaat caatgaaaaa aatagttgaa tggattaaga aaggctactt gatgaatggg 780
 tctcagtatg atggctcagc tgacattcaa aacttcgcca atggacaaac tgcttttact 840
 atcctatggg ctccagctca accaaaaact caagcaaaat tattagagtc aagtaaagtg 900
 gattaccttg aagtgccatt cccatcagaa gatggaaaac cagatttaga ataccttggt 960
 aatgggttttg cgggtctttaa taataaagat gaaaacaaag taaaagcctc taagaaattht 1020
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 agaaccttat gggtcccaat ggttcaatct gtatccaatg gtgatgaaaa accagcagat 1260
 gctttgaaag actttactca aaaagcaaat gataccatta aaaaagcagc taaataa 1317

<210> 137

<211> 438

<212> PRT

<213> Streptococcus agalactiae

<400> 137

Met Ser Ile Lys Lys Ser Val Ile Gly Phe Cys Leu Glu Ala Ala Ala

1 5 10 15

Leu Ser Met Phe Ala Cys Val Asp Ser Ser Gln Ser Val Met Ala Ala

20 25 30

Glu Lys Asp Lys Val Glu Ile Thr Trp Trp Ala Phe Pro Thr Phe Thr

35 40 45

Gln Glu Lys Ala Lys Asp Gly Val Gly Thr Tyr Glu Lys Lys Val Ile

50 55 60

Lys Ala Phe Glu Lys Lys Asn Pro Asn Ile Lys Val Lys Leu Glu Thr

65 70 75 80

150

Ile Asp Phe Thr Ser Gly Pro Glu Lys Ile Thr Thr Ala Ile Glu Ala

85

90

95

Gly Thr Ala Pro Asp Val Leu Phe Asp Ala Pro Gly Arg Ile Ile Gln

100

105

110

Tyr Gly Lys Asn Gly Lys Leu Ala Asp Leu Asn Asp Leu Phe Thr Asp

115

120

125

Gln Phe Ile Lys Asp Val Asn Asn Lys Asn Ile Ile Gln Ala Ser Lys

130

135

140

Ser Gly Asp Lys Ala Tyr Met Tyr Pro Ile Ser Ser Ala Pro Phe Tyr

145

150

155

160

Met Ala Phe Asn Lys Lys Met Leu Lys Asp Ala Gly Val Leu Lys Leu

165

170

175

Val Lys Glu Gly Trp Thr Thr Ser Asp Phe Glu Lys Val Leu Lys Ala

180

185

190

Leu Lys Asn Lys Gly Tyr Thr Pro Gly Ser Phe Phe Ala Asn Gly Gln

195

200

205

Gly Gly Asp Gln Gly Pro Arg Ala Phe Phe Ala Asn Leu Tyr Ser Ala

210

215

220

Pro Ile Thr Asp Lys Glu Val Thr Lys Tyr Thr Thr Asp Thr Lys Asn

225

230

235

240

Ser Val Lys Ser Met Lys Lys Ile Val Glu Trp Ile Lys Lys Gly Tyr

245

250

255

Leu Met Asn Gly Ser Gln Tyr Asp Gly Ser Ala Asp Ile Gln Asn Phe

260

265

270

Ala Asn Gly Gln Thr Ala Phe Thr Ile Leu Trp Ala Pro Ala Gln Pro

275

280

285

151

Lys Thr Gln Ala Lys Leu Leu Glu Ser Ser Lys Val Asp Tyr Leu Glu
290 295 300

Val Pro Phe Pro Ser Glu Asp Gly Lys Pro Asp Leu Glu Tyr Leu Val
305 310 315 320

Asn Gly Phe Ala Val Phe Asn Asn Lys Asp Glu Asn Lys Val Lys Ala
325 330 335

Ser Lys Lys Phe Ile Thr Phe Ile Ala Asp Asp Lys Lys Trp Gly Pro
340 345 350

Lys Asp Val Ile Arg Thr Gly Ala Phe Pro Val Arg Thr Ser Phe Gly
355 360 365

Asp Leu Tyr Lys Gly Asp Lys Arg Met Met Lys Ile Ser Lys Trp Thr
370 375 380

Gln Tyr Tyr Ser Pro Tyr Tyr Asn Thr Ile Asp Gly Phe Ser Glu Met
385 390 395 400

Arg Thr Leu Trp Phe Pro Met Val Gln Ser Val Ser Asn Gly Asp Glu
405 410 415

Lys Pro Ala Asp Ala Leu Lys Asp Phe Thr Gln Lys Ala Asn Asp Thr
420 425 430

Ile Lys Lys Ala Ala Lys
435

<210> 138

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

40

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

43

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

42

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

32

<210> 142

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 142

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23

<210> 143

<211> 82

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 143

catgatatcg gtacctcaag ctcatatcat tgtccggcaa tgggtgtgggc tttttttggt 60
ttagcggata acaatttcac ac 82

<210> 144

<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 144

gcggatcccc cgggcttaat taatgtttaa aactagtcg aagatctcgc gaattctcct 60
gtgtgaaatt gttatccgct a 81

142 23 143 82 144 81

<210> 145
<211> 24
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 145
cgccagggtt ttcccagtca cgac

24

<210> 146
<211> 20
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 146
tcaggggggc ggagcctatg

20

<210> 147
<211> 22
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 147
tcgtatgttg tgtggaattg tg

22

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

26

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

43

<213> Artificial Sequence

<223> Description of Artificial Sequence: Primer

46

<210> 151

<211> 45

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 151

aagtatcaga tctgatatcc atcacaaaca gataacggcg taaat

45

<210> 152

<211> 24

<212> DNA

<213> Staphylococcus aureus

<400> 152

tcacaaacag ataacggcgt aaat

24

<210> 153

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 153

cgggatccgc caccatgacc acttctcaag ctgttttagc

40

<210> 154

<211> 31

<212> DNA

<213> Artificial Sequence

156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

<220>

<223> Description of Artificial Sequence: Primer

<400> 154

ttgcggccgc acgattatca acaaagttct g

31

<210> 155

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 155

cggatccgcc accatggcta ctcatattgg aagttaccag c

41

<210> 156

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 156

ttgcggccgc agggtttatt tggtgaagtg tcttg

35

<210> 157

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

TTGCGGCCGC

<400> 157

cggatccgcc accatgtatc tatatcattt accaatgccc

40

<210> 158

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 158

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34

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42

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34

<211> 35

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35

<211> 37

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<223> Description of Artificial Sequence: Primer

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37

<211> 39

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cggatccgcc accatggcga ctaaagagtt aggtgttag

39

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39

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161

<210> 167

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<212> DNA

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<400> 167

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42

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39

161 42 34 39

<211> 34

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34

<211> 44

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cggatccgcc accatgaata ctatttataa tacattgaga acag

44

<211> 31

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ttgcggccgc ttctttgttc caactttctg g

31

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41

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35

<210> 177

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<400> 177

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43

<210> 178

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<400> 178

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37

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30

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<210> 184

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<220>

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<400> 184

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32

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<210> 186

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<212> DNA

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ttgcggccgc atttagtggtt atttctcctg ttgcataatc c

41

<210> 187

<211> 37

<212> DNA

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cgggatccac catgtacacg catattgttg aaaaaag

37

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33

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40

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33

168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

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<210> 193

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33

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<210> 198

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39

<210> 199

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<212> DNA

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17

171
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<400> 200

ttgcggccgc

10

<210> 201

<211> 28

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<223> Description of Artificial Sequence: Primer

<400> 201

atggaaaaaa atacttgga aaaattac

28

<210> 202

<211> 27

<212> DNA

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ctattttggt ttagcgatgt ctttatac

27

<210> 203

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<212> DNA

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<223> Description of Artificial Sequence: Primer

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<210> 204

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<212> DNA

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30

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28

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<220>

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30

<210> 208

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<400> 208

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24

<211> 31

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atgacaaaaa aacttattat tgctatatta g

31

<211> 27

<213> Artificial Sequence

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ttaacgatta tcaacaagt tctgtac

27

<211> 24

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atgatacgcc agtttttaag agaa

24

27